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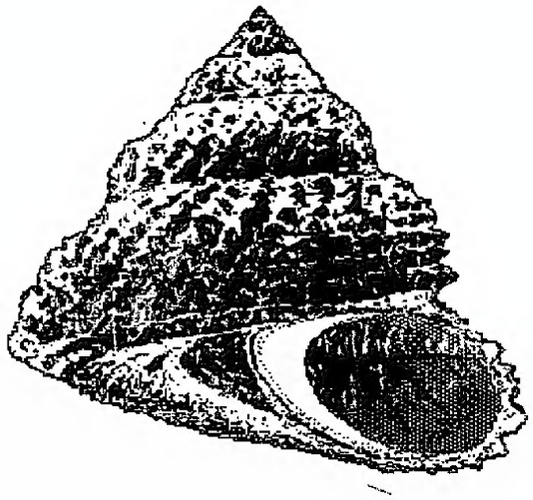

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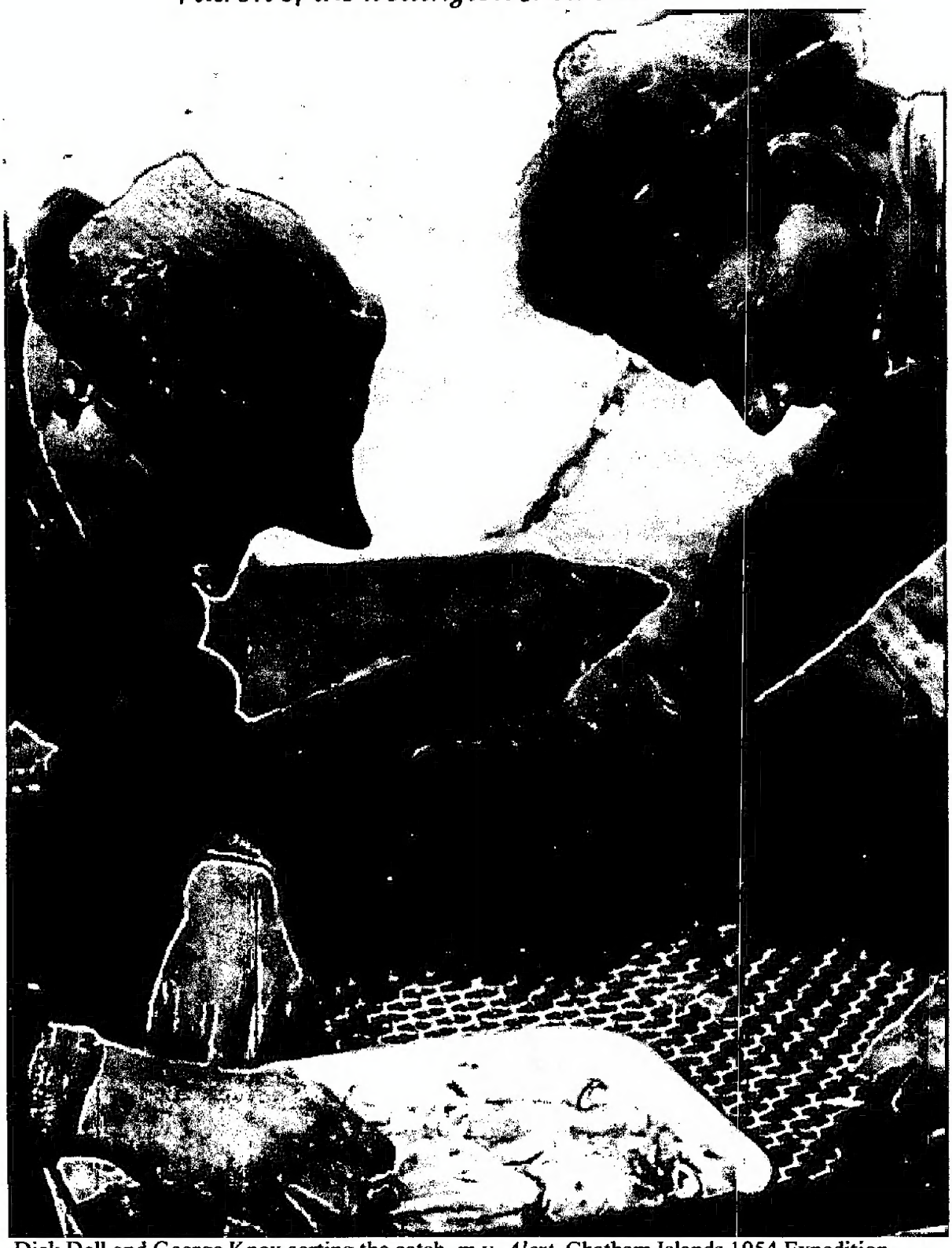
IN MEMORIAM : Dr R.K DELL 1920-2002

Patron of the Wellington Shell Club



Dick Dell and George Knox sorting the catch, m.v. *Alert*, Chatham Islands 1954 Expedition
Photo: Dr E.J. Batham

DR RICHARD KENNETH DELL, 1920-2002 – and a little personal history of the Wellington Shell Club

By Alan Beu

Dr "Dick" Dell was the founder (in 1955) and patron of the Wellington Shell Club, and we literally owe everything the club is to him. I first started in the shell club when I was about 15 (in about 1959 or 1960), after meeting up with Winston Ponder and shells at a Hutt Valley High School science fair (although I had been pottering with them myself since about the age of 12). Meetings were held in Dick's office at the Museum, as only 6-8 people were at most of them, but its later popularity meant we had to move to the Boardroom. We youngsters (Winston, Sid Hulme, Dennis Fairfax, me, and a few others; with Sandy Bartle, later on) were kept quiet by a few older members. Of these I remember Bill Paul, of course (he was the greatest stalwart of the club until the 1980s) and Les Hosking. One of the first events I remember was the first club field trip, to the shore at Island Bay, in 1960 – a real eye-opener! I had NO IDEA one could go and find those things from Powell's books just around the Wellington south coast! In fact we are lucky with that rich rocky shore right at our back door.

One of the highlights of the meetings each year for me were the visits to the Geological Survey, where Dr (late Sir Charles) Fleming had always laid out seemingly endless trays of fossil shells. That was what pushed me into the direction of paleontology rather than zoology, I think, although working as a technician in Geology at Victoria University later on also helped. In those days Dr Marwick was still available for discussions, too, and I visited him at his home (in Cambridge Terrace, Lower Hutt) several times, to pick his brains about fossil shells. With Dick kindly arranging the Shell Club meetings, and basically spending each meeting telling us almost everything he knew about shells, working through group by group, and Drs Fleming and Marwick available in Lower Hutt to go and worry about identifications of fossils, it was a rich time! – I was very lucky. And it's probably why Lower Hutt produced both Winston and me, both now working professionally with molluscs. There is no doubt that the initial influence was Dick's, with the Shell Club.

Later on Winston, Dennis Fairfax and I did several tramps collecting land snails around the Lower Hutt hills, and got quite involved in the identification of snails – long before Frank Climo began to show what a richly diverse hoard remained unnamed. Les Hosking also was very kind with specimens, and we went on several trips around the Eastbourne-Cape Palliser coast collecting shells on the weekends. All this led to my decision to continue on with shells and fossils at "Varsity", and I owe much to all these people. One of the liveliest of them in the earliest days was Sid Hulme, a keen scuba diver and dredger of shells around both Auckland and Wellington. Sadly, Sid drowned in Wellington Harbour quite early on, working on an anchorage for his boat while wearing home-made scuba gear, and put everyone off diving for a while!

As a boy, Dick was one of the keen members of Dr Powell's shell club in the Auckland Museum, along with Charles Fleming (it's a small group, really!). He served in the war, in the Solomon Islands among others places, and was one of the many who returned to civil life and the struggles of a part-time degree while holding down a job and raising a family. He joined the Dominion Museum in 1947 as the mollusc specialist, taking over from Marjorie Mestayer. He built the collection up from only 5000 registered lots to more than 32 000, beginning the great growth that has seen it become a collection of global importance (particularly under Bruce Marshall's care). Dick's first major research publication was the results of his MSc research on New Zealand octopus and squid (*Dominion Museum Bulletin* 16, 1952), a real pioneering effort at a time when

few species had been caught around New Zealand. Probably his most major contribution to the knowledge of New Zealand Mollusca was the results of the Chatham Islands 1954 Expedition (which Elliot will write a little more about), published as "The archibenthal Mollusca of New Zealand" (*Dominion Museum Bulletin* 18, 1956). In this Dick provided the evidence to explain the long-mysterious depositional environments of New Zealand's richly diverse Cenozoic fossil molluscan fauna: many of them were deposited in quite deep water, well beyond the shelf edge. Here such "treasures" as *Parvamussium, Euciroa, Falsilunatia, Galeodea, Sassia kampyla*, large species of *Comitas*, and *Scaphander* were discovered living around New Zealand for the first time. This was an almost *unbelievable* revelation to paleontologists and we young students alike!

Not long after this Dick started to work on the Oceanographic Institute's collections of Antarctic molluscs, and I well remember several highly enjoyable Christmas school vacations being *paid*(!!) to sort shells from those samples, mainly from the Ross Sea. He worked also on other Antarctic molluscan collections, and in 1964 published a major monograph of the Antarctic bivalves, chitons and scaphopods collected by the "*Discovery*" Expedition (the gastropods having been worked up by Dr Powell). But in 1961 he became Assistant Director (to Dr Falla) and in 1966 Director of the Museum, and had little time for shells from then until his retirement in 1980. Then in the 1980s he set to work again to write up the Ross Sea molluscs, eventually published as "Antarctic Mollusca, with special reference to the fauna of the Ross Sea" (*Royal Society of NZ Bulletin* 27, 1990, 311 pp). It is the one helpful guide to the identification of Antarctic molluscs ever published. Along the way Dick published more than 150 other papers on molluscs, fossils, crabs and more minor groups, and in total named more than 300 species of molluscs from New Zealand.

Dick also served on an astonishing variety of societies and committees that keep science active and organised in New Zealand, including the Historic Places Trust, the Ross Dependency Research Committee, the National Parks and Reserves Authority, the NZ Ecological Society, the NZ Marine Sciences Society (president 1963-65), the Art Galleries and Museums Association of of NZ (president 1958-59), the Scientific Subcommission of UNESCO, and the Royal Society of New Zealand (including Editor, Transactions RSNZ, 1964-69, and President, 1977-81). He was awarded a Nuffield Travelling Fellowship in 1959-61, to work on molluscs at the British Museum in London, was elected a Fellow of the Royal Society of New Zealand in 1961, and won the Hector Medal of the Society in 1965. He was also awarded a Galathea Medal by Denmark, a QSO in 1981, and a NZ 1990 Commemoration Medal. It is particularly sad to see him go, the last of his great generation of pioneer New Zealand malacologists and marine biologists who brought the science to the leading position it has today. My personal memories are of a very kind, patient man who tried to help everyone, and would go out of his way to identify that one last little turrid from Castlecliff that defied the books – and that led on to so much satisfaction and enjoyment to me in my research. As his daughter Sharon said at his funeral, everyone who ever collected on a rocky shore with Dick will always remember his cry of "Turn the stones back over!", and will remember his wish to conserve the rich intertidal fauna and flora of New Zealand.

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DICK DELL - FRIEND AND MENTOR – SOME RECOLLECTIONS

By Elliot Dawson

I can't remember exactly when I first met Dick Dell – I think it was in 1949, but it wasn't too long after he had joined the Dominion Museum as Conchologist in 1947. Dick was one of that great band of exservicemen who returned to university studies in the Zoology Department of Victoria University College in the early postwar years. All of them, in due course, went on to distinguished scientific careers. One of these men was Ray Forster had just come to the Canterbury Museum in 1948 as a zoologist after completing his M. Sc. with a thesis on harvest spiders. He quickly took my school friend John Yaldwyn and me under his wing as young tyros of natural history. Ray subsequently gained his D.Sc.in 1953, and later became Director of the Otago Museum and a world authority on spiders. On his appointment to the Canterbury Museum he took over the afterschool natural history classes for local school children which had been run by his predecessor Arthur W. Parrott and, occasionally, by the Director, Dr R.A. Falla. Ray was a great encourager of young people and amateurs (he had begun at the Dominion Museum at the age of 18) – a gift borne out throughout his life and especially in his popular books on spiders. Ray learned that I quite often went up to Wellington in the holidays to stay with my buddy John Yaldwyn at his parents' home at Point Howard on the way to Eastbourne – so he gave me a letter of introduction to Dick Dell, his former fellow student and museum colleague, so that was the beginning of a long and valued friendship for all three of us. We got a very warm reception from Dick, heaps of encouragement, and, although we had known its Director, Dr R.A, Falla while he was Director of the Canterbury Museum till 1948, we had a new way of getting behind the scenes in this great institution. Indeed, this introduction may have led to my schoolmate eventually stepping into the shoes of these two museum directors by becoming Director himself in due course, as well as, like Dick Dell, a respected authority on the Crustacea yet remaining, like these two mentors, widely versed in natural history matters.

We didn't bother Dick too much – he was pretty busy re-organising the museum's shell collections and finishing off his M.Sc. thesis on the New Zealand Cephalopda – which he did by 1950. I remember that we did quite often use his friendly assistance in identifying shells we found in Maori sites which we had been excavating as schoolboy archaeologists (but not entirely without some training, thanks to Roger Duff, then ethnologist, later Director, of the Canterbury Museum). From about 1946 we worked through middens near the famous Moa Bone Cave at Redcliffs near Christchurch, cycling out there from school with our spades and things – though we didn't get round to publishing the results [*Records of the Canterbury Museum* 9] until 1975 (some lesson to be learned from this?). In 1951 we dug at a habitation and burial site at Long Beach, Otago Peninsula which I had lighted upon in 1947 [*Journal of the Polynesian Society* 58; 1949] - impossible to have done so in to-day's climate, but it was written up rather more quickly, going round in virtually concentric circles or sliding alternately to port or also in the *Journal of the Polynesian Society* [61; 1952], with the findings recently being appreciated in Jill Hamel's 2001 DOC publication on the archaeology of Otago). Other such places, Paremata for instances, yielded their shells for Dick to tell us about.

When I came to do my thesis on what was then called *Amphidesma*, I was troubled with the identification [and still am!] with the rather elongated *forsterianum*-like species that lived on the shore of Pegasus Bay, rather different from the more typical larger form found in the sheltered bays of Banks Peninsula and whose eroded valves occasionally washed up on the New Brighton beach. Dick was very generous in lending me specimens from the museum collections, and in

giving me his ideas on variation and speciation in the tuatuas. He steered me off devoting my time to their taxonomy – and, in retrospect, I'm pleased for that, in the light of what Alan Beu, Joyce Richardson, and others have done to hopefully resolve this problem. Much later when I got interested in crabs, Dick's examples and ideas were equally valuable and he was just as willing to talk over things.

Two aspects of relationships with Dick stand out for me: the first, which is nothing to do with marine biology or shells, but, nevertheless, shows the trust that Dick put in people he knew and his belief in my capability in particular – which I recalled at time subsequently when I felt was not enjoying such confidence from some other people. Anyway, on one particular occasion, November 1971, he asked me if I would act on behalf of the museum and bid for items at the auction of an important private collection of Maori artifacts to be held in Dannevirke. The Government was making a special grant to the museum for such a purchase but it was to be kept secret until the Prime Minister had made his announcement when the deed had been done – I don't whether it was an election year or what deep political motive lay beneath it all – but I was sworn to secrecy and the museum was not to be seen as involved, certainly until the PM had had his say ... so I talked to my boss about it – he was just as appreciative about Dick's trust in me as I was but wanted me to make sure that I was recorded as on Annual Leave that day – presumably he didn't want the DSIR to be seen as involved either but for different reasons, I guess – and at the very last moment advised me not to use my own name. Well, to cut a longish, but interesting story, short, I went up there, accompanied by Roger Neich, one of the museum's ethnologists (who, somewhat surprisingly, was not recognised as such at the auction). The auctioneer asked me my name: I said "Fox", the first name that came into my head but it turned out to be rather appropriate. I did well, and spend a lot of money, acquired some fine tikis and other treasures, outbidding an American collector (who thought I must have a wonderful collection at home – I assured him I did, even if it belonged to the Nation! – although I didn't tell *him* that). But back at the museum, the other ethnologist listening to the radio, said: "I knew it was a mistake sending Elliot Dawson there – some chap called Fox is completely outbidding us." I don't know what Dick was thinking then but when Roger and I called into the Dell home in Waiwhetu Road on our way back to the museum that night, he was certainly delighted with the booty. Funnily enough, at that very moment on that night at Dame Vivienne Boyd's home, right nextdoor to the Dell's, some ladies (including my spouse – who was sworn to silence too) were discussing who Mr Fox might be and what a pity these artifacts would probably go overseas – little did they imagine what was being shown off so closeby! There was much speculation in news media as to who the mysterious "Mr Fox" was, and for whom he had bought – I had to keep my mouth firmly shut. One of my neighbours, who worked for the NZBC, recognised me on the television news, although the characteristic photograph in the Dannevirke *Evening News* of Thursday 25th November – when the PM broke the news – should have identified me to those who knew that receding hairline! Derek Fox (subsequently of Maori TV fame, but then a Nga Tamatoa spokesman) came to my door and grilled me – but the mouth remained shut. The PM had his say in due course – Mr Fox was forgotten and remained incognito to this day – a long tale but I had to tell it to show where Dick came in.

The second happy story is, of course, what we did on the famous Chatham Islands 1954 Expedition. There are lots of memories from this trip, and not just the thrill of seeing molluscs hitherto only known as fossils from the Tertiary, millions of years back, leaping out in front of our eyes as living animals in our dredges and trawls, and our sharing the gushes of enthusiasm with Dick as he gloated over each new addition to our present-day fauna. I can think of Dick trying to teach me how to steer the *Alert*, the 72-foot ex-Harbour Defence Motor Launch owned by Captain Alex Black, as it rolled and drove its way across pretty rough seas in the very dark nights – I just couldn't stop the thing starboard pushed by a towering following swell. It's a

wonder I ever became an oceanographer let alone a sea scout leader! Dick lay asleep beside me at the wheel: "Wake me if you can't manage." But me, well, I just had to try on my own and let him sleep on – but I wasn't the only new chum. Only Dick and Jock Moreland had sailed with Alex before – indeed, when the vessel arrived at Lyttelton, the two other crew members walked off, leaving the *Alert* to us, saying, as my fiancée overheard, "Well, Alex has bitten off more than he can chew this time." Needless to say, she wasn't too happy – but we'd sailed by then, and thanks to Dick and Jock, we caught on with some nautical skills in time, and returned safely, and, of course, I did marry that girl who thought she'd seen the last of me. There was still well-remembered day, the 26th January, while acting as a ferryboat to pick up three members of the expedition had spent the night ashoreon Pitt Island, a dinghy load of us tipped up in the surf at Glory Bay. Despite one member losing his glasses and others with seawater-filled cameras and bits of gear floating off, we survived – not the least due to Dick's good nature.

Now, finally, what more of Dick, the friend, the mentor? Yes, we'll remember Dick as someone always ready to help, willing to share his knowledge, glad to encourage young people and beginners, and being a role model for publishing results and generally getting on with the job – and this brings me to a special point: for any criticisms we might now have or any apparent shortcomings which later workers might believe they perceive in his scientific work, we should recall the climate in which he did much of his research, the constraints of time and funds (especially during the period in which he was Director of a developing national museum), the limited amount of material available to study, especially from deep water – at one time considered to be anything over 100 fathoms! We should remember that until our 1954 expedition, apart from 2 stations done in 1874 from the *Challenger*, 2 from *Discovery* II, and 1 from the *Galathea*, no molluscs had ever been collected in New Zealand waters deeper than 200 fathoms until we did 10 stations in greater depths during our expedition to the Chathams – no wonder Dick was so excited at what came up during those pioneer days! His "Archibenthal Mollusca" Dominion Museum bulletin was a great contribution in its day – and should always be appreciated as such. (I recall that he sent me copy when I was studying in England in 1956 and that surface postage was 8½d – I found the stamp still on it.). What could he have produced now with the wealth of deepwater specimens still coming to hand? While I was at the Oceanographic Institute I once did a comparison of our increased knowledge of the deepwater fauna, largely due to the hundreds of well-documented stations carried out during the Institute's benthic sampling programmes - by analysing identifications of all the Scaphopoda, which I was keen on at that time (and still am) and then looking at what Dick had found in his earlier review of 1957. It was quite striking what advances in available knowledge had been made – but it didn't lessen the worth of Dick's earlier work at all, considering what he had available to him then – and this still remains as our published knowledge of the New Zealand Scaphopoda as such.

As Dick, himself, wrote of the author in the foreword to the 1975 reprint of Elsdon Best's "Maori Agriculture", *Dominion Museum Bulletin* No. 9 –

"His work must, however, be judged in the light of the times in which he wrote, rather than with the hindsight we can use today."

So it is with Dick – he was a true museum man – he handled material intimately, learned from it, and published well.

Farewell, Dick – thanks for all you did for us …

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R. K. DELL AND MARINE CARCINOLOGY

By John Yaldwyn

In addition to his wide interest in New Zealand molluscs, Dick Dell is remembered for his expertise in another group of New Zealand shelled invertebrates – the *crabs*. Crabs belong, with the insects, spiders and crustaceans, to a group of animals called the Arthropoda, characterised by having segmented bodies with a firm external skeleton made up of overlapping plates, and bearing jointed limbs of several different kinds.

Dick published more than a dozen papers in scientific journals on crabs between 1960 and 1971 covering such subjects as new records from New Zealand shallow and deep waters, new species of fossil and Recent crabs, including the dramatically spined frilled crab *Trichopeltarion fantasticum* described in conjunction with Prof. Laurie Richardson of Victoria University when it was pointed out to them (by the writer of this note) that they both had material of the same new species under independent description. Dick also gave us a checklist of New Zealand crabs and discussed the composition and distribution of the New Zealand crab fauna. One of his new recordings was written up jointly with Bruce Marshall when Bruce found a high tidal shore crab in large numbers near Whakatane in the Bay of Plenty previously known only from the Kermadec, Lord Howe and Norfolk Islands.

Two books with extensive information on New Zealand crabs were published by Dick Dell during this carcinological period in his marine biological research career. His little yellow A.H. & A.W. Reed booklet on *Native Crabs* (1963) in the Reed 'Nature in New Zealand' series is a special gem, and helped many of us to develop our interest in these animals. Dick's *Native Crabs* illustrates and gives common and scientific names for 43 New Zealand crabs and crab-like decapods. Notable amongst this coverage is a series of important drawings of New Zealand spider crabs (genera *Paramithrax*, *Leptomithrax* and allies, pp 25-34) which anticipated by several years Des Griffin's definitive monograph on New Zealand spider crabs (family Majidae) published by the N.Z. Oceanographic Institute in 1966. Dick's figures allowed beachcombers and fishing boat frequenters to at last be able to identify their seaweed and masking crabs dried shells and attached nippers from their characteristic spination and tubercle patterns. In my personal case, Dick's special figure of the plate-backed crab (*Acanthophrys*, now *Thacanophrys filholi*, p. 34) allowed me to name several trawled unknowns that I had accumulated from the Cook Strait trawling grounds during my university student days.

Dick's larger and more general Reed book *Seashore Life of New Zealand* (1971), illustrated with a series of colour plates by *Dominion* newspaper cartoonist Eric Heath, is quite different from *Native Crabs*. Dell and Heath cover basic seashore ecology, shallow water fishes, sea slugs and sea cucumbers, sea urchins and starfish, chitons and other molluscs, including squids and octopuses, crabs, crayfish and shrimps, barnacles, brachiopods, bryozoans, worms, jellyfish and hydroids, sponges, and seaweeds as well as beach-cast animals found along intertidal drift lines. The colour plates are clear, bold and very bright, certainly accurate, but sometimes appearing a little too garish (maybe an artist looking at fresh, clean specimens without any preconceived ideas on what colour common marine animals and plants are!). Two plates of crabs and three of other crustaceans are there, but for a carcinologist their smoothtail crayfish (*Jasus*, now *Sagmariasus*, *verreauxi*, fig. 120) in its immature green colour phase is unique as adult packhorse crayfish are orange-yellow, with little mention ever given to the green immatures in any general natural history reference work. The bright red lobster krill (*Munida gregaria*, fig. 203) is also a delight to

see, captioned with Dick's comment that in southern New Zealand waters they are "often in schools so closely packed as to colour the sea."

And now for an "Australian Seashore Life" story to close this account of RKD and marine carcinology: Dick visited Sydney and stayed with us in mid to late1960s. I took him out to Long Reef, near Collaroy, a little north of the entrance to Port Jackson, to see a range of eastern Australian warm temperate intertidal animals and plants, especially molluscs and crabs of course Long Reef is a well-visited, classic marine biological site, where a southern extension of Australian tropical fauna overlaps the standard eastern Australian warm temperate flora and faunal suite. I carefully and extensively cautioned Dick on all the Australian marine dangers I could think of: unexpected rogue waves that could sweep him off the reef, deadly tropical sea wasps or cubomedusae, *Chironex fleckeri* or related species (too far south at Long Reef), stinging Portuguese men-of-war (well-known, anyway, to Dick from Kapiti coast beaches), the bristle-worm *Eurythoe* loaded with stinging setal spines, poisonous stinging cone shells (seldom found as far south as Long Reef), the often fatally venomous blue-ringed octopus, *Hapalochlaena maculosa* (often found at Long Reef and nearby eastern Australian rocky beaches), the venomous coral reef stonefish, *Synanceichthys verrucosus* (not known south of the true Barrier Reef), sharks (especially if he was washed off the reef at the wrong time of the year), and venomous sea snakes (dead unlucky to find one unexpectedly off central New South Wales). Fully briefed, Dick Dell goes to his first big intertidal platform pool on Long Reef, on his first Australian marine biological collecting trip that I am aware of, and plunges his hand deep into the pool to pick up some dead mollusc shells from the bottom when a tiny moray eel puts its head out from a crevice in the side of the pool and latches on to Dick's finger - never known to have happened to anyone before or since at Long Reef! The little moray drew blood, and Dick's finger took days to heal. So, you see, it's not the known dangers that get you in the end (of the finger) ...

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Dr John Yaldwyn was a member of the legendary 'Chatham Islands 1954 Expedition' which will always have its place in the annals of New Zealand molluscs. Then a student at Victoria University College of Wellington engaged on a thesis of the Systematics and Distribution of the Natantia (the old name for shrimps and prawns) of New Zealand waters, he was, in fact, the "crew"of the expedition's vessel, the *Alert*, being responsible for its running under the eagle eye of its Master, Captain Alex Black. Thanks to John's skills we all managed to get back safely. After getting behind the scenes at the Dominion Museum as a schoolboy (and meeting up with Dick Dell then), John was a zoologist there from 1959-1961, did a stint in Australia from 1962 to 1968 and came back as Curator of Crustacea at the Dominion [later 'National'] Museum from 1969 to 1979, then its Director from 1980 to 1990 when he retired, and now continues active research as an Honorary Research Associate of the Museum of New Zealand Te Papa Tongarewa at its Tory Street site. The Wellington Shell Club was always strongly supported by John over the years in which he was in office at the museum and he made sure that the Club could always find a meeting place somewhere on its premises.

If you ever go live shell-collecting in Australia, don't be put off by the long list of potential dangers you might encounter, as John has just detailed – just be *careful*! Based on his experiences while Curator of Crustacea at the Australian Museum in Sydney from 1962 to 1968, John wrote two first-rate books, *Australian Seashores in Colour* (with Keith Gillett) in 1969 (reprinted 1978) and *Australian Crustaceans in Colour* (with Tony Healy) in 1970, both immaculately illustrated and packed with fascinating information. Don't go away without them. You'll find plenty to read in them about stinging and biting and venoms and so on. So you *have* been warned!

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NEW ZEALAND MOLLUSCAN SPECIES NAMES COMMEMMORATING Dr R.K. DELL: what they were & what's happened to them

By Elliot Dawson

Quite a number of new species of molluscs found living within the New Zealand Region have been named by colleagues in appreciation of the contributions made by Dr R.K. Dell to our knowledge of the Mollusca. As happens with the advance of knowledge, some of the supposed new species have subsequently been found to represent previously described ones, and, accordingly, their present-day names are no longer the same as those given to them when originally described by Dick's associates. In scientific parlance they have become synonyms, and, hence, "synonymised" or, as some scientists prefer to say (somewhat dramatically I always think), have been "sunk" in synonymy (rather like throwing them back into the sea again!). Whatever you like to call it, these names have to be abandoned – at least until such time as another investigator (or even the same person who did the first "sinking") decides that the name *was* correctly applied and the animal gets officially resurrected (or perhaps "resuscitated" might be more apt).

I thought it might be an interesting exercise, let alone a timely one, to list such species, together with a little background information about them, and find out what they should be called nowadays – in terms of our latest version of the checklist of New Zealand molluscs published in 1996 by Hamish Spencer and Richard Willan, and now updated to 2002 and available as an electronic document (able to be regularly updated) on the internet.

Similar fates have, of course, befallen many of the species which Dick, himself, had described over the years. I felt particularly sad when a rather nice species, *Benthindsia miriamae* Dell, 1967,[1] which Dick had named for his wife, Dame Miriam Dell, was somewhat ignominiously "sunk in synonymy." Such can be the life of a newly-described species! Survival of the (taxonomically) fittest, I suppose. Walter Cernohorsky (1981: 35) showed that Dame Miriam's species was, in fact, an example of *Nassaria* (*Microfusus*) *spinigera*, a species described by the Japanese workers Hayashi and Habe in 1965. Similarly, the genus *Dellina* proposed by Dr Alan Beu in 1970, a nice name because it's not too often you can get a new genus named after you, has now been found to be a synonym of *Belomitra* named as long ago as 1882 by Fischer. However, there's still enough things called "*delli*", both in the New Zealand fauna and overseas, to recall Dick's lasting contribution to the study of molluscs.

Of course there are other species, both of molluscs and crustaceans, which colleagues have named after Dick Dell. I have only dealt with the present-day New Zealand shells here[3] but there are others of interest discovered in other parts of world, which, too, have suffered their fates: for instance, in 1996, a Japanese worker described a supposedly new species, *Brookula delli*, from Breid Bay, Antarctica, "named in honour Dr R.K. Dell for his eminent contributions to the Antarctic molluscan fauna" (Numanami 1996: 55-57, fig. 30A-E). However, not long afterwards, a group of Brazilian conchologists (Absalão *et al.* 2001), decided that this species was, in fact, an example of *Brookula pfefferi*, a species which A.W.B. Powell had described in 1951 from off the Stromness Harbour in South Georgia (Powell 1951: 104, pl. V, fig. 8), collected in 1927 during the *Discovery* investigations. At least two New Zealanders got their mention, even if *Brookula delli* went down the gurgler of synonymy!

COMMEMORATIVE SPECIES LIST
[Original name given first; latest name in **bold** type]

GASTROPODA

1. *Turritellidae: Zeacolpus (Stiracolpus) delli* Marwick, 1957
   Marwick 1957:31-32, pl. 3 figs 14-15, pl. 4 figs 11-12.
   Type locality: Wellington Harbour, 41° 17.6' S, 174° 50.8' E, 20 metres, collected by R.K. Dell and J. Moreland.
   Powell 1979: 127; Beu & Maxwell 1990: 407 (as *Stiracolpus delli delli*, with fossil subspecies noted) Spencer & Willan 1996: 17; Spencer, Willan, Marshall, & Murray 2002 = ***Zeacolpus (Stiracolpus) pagoda pagoda* (Reeve, 1849)**

2. Littorinidae: *Macquariella delli* Powell, 1955
   Powell 1955: 75, pl. 1 fig 10 (as *Macquariella*).
   Type locality: Antipodes Islands, collected by Dr W.R.B. Oliver, 1927.
   Spencer & Willan 1996: 18; Spencer *et al.* 2002 = ***Laevilittoria* (*M.*) *delli* (Powell, 1955)**

3. Trochidae: *Calliotropis* (*Calliotropis*) *delli* Marshall, 1979.
   Marshall 1979: 528-529, fig 3D-G, table 3.
   Type locality: off Raoul Island, SE of Nugent Island, Kermadecs, 29° 14.7'S, 177° 49.4'W, r/v *Acheron*, Stn BS 438, 165-146 m, 28 October 1975.
   Spencer & Willan 1996: [Kermadec fauna not included]; Spencer *et al.* 2002 = ***Calliotropis* (*C.*) *delli* B.A. Marshall, 1979**

4. Eatoniellidae: *Eatoniella* (*Eatoniella*) *delli* Ponder, 1965
   Ponder 1965: 66-68, pl. 9 figs 2-6 (in subgenus *Cerostraca*).
   Type locality: Bream Tail, Northland, on *Corallina* algae, collected by W.F. Ponder, 21 August 1963).
   Powell 1979: 91, fig. 14:6 (as *E.* (*Cerostraca*) *delli*); Spencer & Willan 1996: 18; Spencer *et al.* 2002: = ***Eatoniella delli* Ponder, 1965**

5. Rissoidae: *Onoba* (*Ovirissoa*) *delli* Ponder, 1968
   Ponder 1968*b*: 115, text-fig. B ("This species is named for Dr R.K. Dell who had separated it out as a new species but has generously allowed the writer to describe it.").
   Type locality: Lyall Bay, Wellington.
   Powell 1979: 113 (as *Ovirissoa delli*); Spencer & Willan 1996: 20; Spencer *et al.* 2002: = ***Onoba* (*Ovirissoa*) *delli* (Ponder, 1968)**

6. Buccinidae: *Penion benthicola delli* Powell, 1971
   Powell 1971: 222-223, fig. 24.
   Type locality: ENE of Poor Knights Islands, 366-475 metres, C. Wormald.
   Powell 1979: 201 (as P. *benthicola delli*); Dell 1995: 13-14, figs 23-25, 33, table 2 (as *P. benthicolus* Dell – "... no grounds for differentiating a northern subspecies."); Spencer & Willan 1996: 27; Spencer *et al.* 2002: = ***Penion benthicola* Dell, 1956**

7. Pyramidellidae: *Planpyrgiscus delli* Powell, 1976
   Powell 1976: 108 (as *Turbonilla* (*Planpyrgiscus*), new name for *P. lawsi* Dell, 1956: 156-157, pl. 18, fig. 176, not of Powell 1937: 210, as *Chemnitzia* – see Powell 1979: 258, pl. 53:2, as *Turbonilla*).

Type locality: Portobello Marine Biological Station *Alert* Stn 54-17, ENE from Taiaroa Head, Otago Peninsula, 475-640 m, r/v *Alert*, 28 March 1954.
Powell 1979: 259, fig. 62:5; Spencer & Willan 1996: 32 (as *P. lawsi* Dell); Spencer *et al.* 2002: = ***Planpyrgiscus lawsi* Dell, 1956**

8. Athoracophoridae: *Reflectopallium delli* Burton, 1963
Burton 1963: 57, pl. III [*i.e.* text-fig. 3 fig. 6].
Type locality: Central Trio Island, Pelorus Sound, in low bush and scrub.
Powell 1979: 298, fig. 72:6 (as *Reflectopallium*); Spencer & Willan 1996: 39 (as *Pseudoaneitea*); Spencer *et al.* 2002: = ***Pseudaneitea delli* (Burton, 1963)**

9. Charopidae: *Charopa (Ptychodon) delli* Climo, 1969
Climo 1969: 213-214, text-figs 3C, 32A, 34B, pl. 10C, table 15..
Type locality: Ulva Island, Paterson Inlet, Stewart Island.
Powell 1979: 307 (as *Charopa* (*Fectola*)); Spencer & Willan 1996: 39 (*Cavellia delli*); Spencer *et al.* 2002: = ***Cavellia delli* (Climo, 1969)**

BIVALVIA

10. Malletiidae: *Neilo (Neilo) wairoana delli* Marshall, 1978
Marshall 1978: 428-430, figs 2G –I, table 1.
Type locality: head of Pegasus Canyon, NE of Banks Peninsula, 366-311 m, r/v *Acheron*, Stn BS 547, 43° 24'S, 173° 36'E, 366-311 m, 18 March 1976.
Spencer & Willan 1996: 44; Spencer *et al.* 2002: = ***Neilo wairoana delli* B.A. Marshall, 1978**

11. Limidae: *Limatula* (*Limatuletta*) *delli* Fleming, 1978
Fleming 1978: 76-78, figs 82-84 (as *Limatula. japonica delli* in new subgenus *Limatuletta*).
Type locality: off The Three Kings, 805 m.
Powell 1979: 499; Beu & Maxwell 1990: 396; Spencer & Willan 1996: 46; Spencer *et al.* 2002: ***Limatula* (*Limatuletta*) *delli* Fleming, 1978**

12. Hyriidae: *Cucumerunio websteri delli* McMichael & Hiscock, 1958
McMichael & Hiscock 1958: 477, pl. 16, fig. 15.
Type locality: Omaha Stream Leigh, Northland.
Powell 1979: 385, pl. 73:17; Spencer & Willan 1996: 46; Spencer *et al.* 2002: ***Cucumerunio websteri delli* McMichael & Hiscock, 1958**

13. Carditidae: *Carditella delli* Crozier, 1966
Crozier 1966: 41, figs 5-6.
Type locality: Auckland University Department of Zoology Stn AUZ 53, north of the Three Kings, 34° 00'S, 171° 55'E, HMNZS *Tui*, 17 September 1962, 805 m.
Powell 1979: 409, fig. 107:5; Spencer & Willan 1996: 47; Spencer *et al.* 2002: ***Carditella delli* Crozier, 1966**

14. Cuspidariidae: *Cuspidaria delli* Knudsen, 1970
Knudsen 1970: 141-142, text-figs 98-99.
Type locality: *Galathea* Stn 601, Tasman Sea, 45° 51'S, 164° 32'E. 4400 m, *Globigerina* ooze, 14 January 1952, 1 specimen.
Spencer & Willan 1996: 50; Spencer *et al.* 2002: ***Cuspidaria delli* Knudsen, 1970**

NOTES

1 *Benthindsia miriamae* Dell, 1967, was described from its type locality at Auckland University Zoology Department Stn AUZ 114, near 30° 26'S, 178° 15' W, off Curtis Island, Kermadec Islands, from a depth greater than 914 metres, and also recorded from AU Z 11, 30° 45'S, 173° 15'E, Kiwi Seamount, 538-677 m, 6 July 1962. Dr Dell noted that his new species was very similar to *Hindsia spinigera* Hayashi & Habe, 1965, from Japan and was also close to *H. magnifica* (Lischke, 1871), and *H. solida* (Kuroda & Habe, 1961), also both from Japan. He supposed also, at this time, that the four specimens collected on the Kiwi Seamount might prove to be a different species, and, indeed, he was subsequently shown to be correct by Walter Cernohorsky (1981: 34, 35) who commented: "The species *N.* [i.e. *Nassaria*] *miriamae* (Dell) is a composite species. The holotype from the Kermadec Ids. which is in the National Museum of New Zealand, No M-21300 [p. 36, pl. 31, figs 3-4, holotype, figs 6-10, Chanter Id] is conspecific with *N. spinigera*. [He also included two other records from the Museum of New Zealand collections not given by Dell: 29° 13'S, 177° 52'W, 1.8 km NW of Napier Island, in 367-530 m, and at 29° 15'S, 177° 50'W, E of Chanter Island, in 366-402 m, both localities near Raoul Island, in the Kermadec Islands group]. The paratypes of *N. miriamae* from the Kiwi Seamount (between Norfolk Id. and the Kermadec Ids.) are the species *N. solida* Kuroda & Habe." This latter species was described by Kuroda & Habe (1961: 52, app. 24, pl. 31 fig. 16) from 100-200 metres off Cape Ashizuri, Tosa Bay, Shikoku Japan (see also Habe 1964: 86, pl. 31 fig. 10), and has been found to range from Japan to northeastern Australia, New Caledonia, Norfolk Island, and reaching the Kermadecs. It was described and illustrated by Cernohorsky (1981: 33-35, pls 29, 30 [the latter plate being a distribution map]. His figures 4 and 5 on plate 29 show a specimen of *N. solida*, paratype of *Benthindsia miriamae*, taken on the Kiwi Seamount from 538-677 metres. *Nassarius spinigera* was originally described in the genus *Hindsia* Adams, 1851 [Dell (1967: 309-312) has a long discussion of the "chequered" history of this genus; cf. also Cernohorsky 1981: 3-4] by Hayashi & Habe (1965: 12, 14, pl. 1 fig. 5) from 200 metres off Enshu-nada, Honshû, Japan. It was also discussed, described, and illustrated by Cernohorsky (1981: 35, 37, pls 31-32 [pl. 31 figs 3-4 = holotype of *Benthindsia miriamae*, figs 6-10 = specimen from off Chanter Id, Kermadecs; pl. 32 = its distribution map] who found it ranged from Japan to Indonesia, New Caledonia, also reaching the Kermadec Islands in a known depth range of 200 to 915 metres.

Φ Φ Φ

2 The genus *Dellina* Beu, 1970 is part of quite a complicated story of descriptions and name changes, and more of that notorious sinking into synonymy - or oblivion – that happens to many otherwise well-meaningly-described, presumed "new" species.

In 1970, Alan Beu erected the new genus *Dellina* based on a present-day specimen of the genus *Waipaoa* Marwick, 1931 [the type species of which was *Admete cristata* Marwick, 1926, from the Tongaporutan stage of the New Zealand Tertiary, family Cancellariidae], *Waipaoa munida* described by Winston Ponder in 1968 from off eastern Otago. Alan Beu also described another new fossil species of *Waipaoa*, as *W. delli* from Bell's Creek, a tributary of the Mangaopai Stream in the Wairarapa (Beu 1970: 224, pl. 4 fig. e). The first living example to be found of the genus *Waipaoa* was taken on that memorable Chatham Islands 1954 Expedition (at Stn 5 in 348 m, and Stn 59 in 530 m), and it was subsequently described by its collector as *Waipaoa marwicki* (Dell, 1956: 112-113, pl.11 fig. 113) who remarked: "This is the first record of a living species of this genus" [3 fossil species were

known at this time] – another one of those "living fossils" which members of that expedition were privileged to behold coming up in their trawls! When Winston Ponder (1968*a*: 46, pl. 4 fig 57), later on, described his one taken at Portobello Marine Biological Station Stn MU-67-61, ESE of Taiaroa Head, Otago Peninsula, from 630-685m, in 1967, he was able to comment: "It is the second Recent species of *Waipaoa* to be recorded and is named after the Portobello Biological Station vessel *Munida*."

In their compendium of the New Zealand Cenozoic Mollusca, both *Waipaoa delli* and *W. munida* were included by Beu & Maxwell (1990: 421) in the genus *Ingisella* Finlay, 1924, and this placing was followed by Maxwell (1992: 167), including *W. marwicki*, which still remains in this genus as a member of the family Cancellariidae/Cancellariinae. However, overseas studies by Bouchet & Warén (1985: 223; 1986: 474) had demonstrated that *Dellina* of Beu, 1970 was the same thing as the old genus *Belomitra* founded by Fischer as far back as 1882 (based on *B. paradoxa* n. sp., from the Atlantic Ocean in 627 m; = *Belomitra quadruplex* (Watson, 1882: 253-254 – noted as "a singularly attenuated form of great beauty, unhappily much broken"), *Challenger* Stn 73, west of the Azores, in 1028 m, since Watson's description was published prior to Fischer's – see *Journal de Conchyliologie* 30: 225). Furthermore, *Waipaoa munida* of Ponder 1968 (from off eastern Otago) was found to be a synonoym of *Antizafra aoteana* described by Dick Dell in 1956 (p. 111, pl. 11 fig. 110) from the Chatham Rise, which was, in its turn, considered to a synonym of *Belomitra climacella* described, in the genus *Pleurotomella*, from off the Hawaiian Islands in 640 metres by W.H. Dall (1895: 679, pl. 31 fig. 14) – a lot of "sinking in synonymy" going on here!

And more to come – Bouchet & Warén (1986: 474) remarked: "*P. climacella* was described as a turrid, *A. aoteana* was described as a columbellid and *W. munida* (type species of *Dellina* Beu) was described as a cancellarid ... there seems to be no doubt that they belong to *Belomitra* judging from shell characters." They continue: "The relations of *B. climacella* and *aoteana* are difficult to evaluate, but compared with the variation of the N. Atlantic *B. quadruplex*, which is somewhat better known, the two species seem to be very close. Challenging this closeness are the widely separated localities, separated by vast abyssal areas, and the fact that both forms have direct or lecithotrophic development. The three forms on which the names are based are however so similar and belong to a group where the only more closely known species is unusually variable, so have seen no possibility of keeping them as separate species without any other evidence for such a distinction. It should, however, be kept in mind that the synonymy by no means is proved. The synonymy of *aoteana* and *munida* is much less questionable the specimens originate from not very distant localities and are very similar."

And if that's not enough, you might like to know that the Western Atlantic Gastropod Database of the Academy of Natural Sciences of Philadelphia (ANSP) tells us that *Belomitra quadruplex* (Watson, 1882), the variation of which has just been mentioned above, has as synonyms the following species which their authors, in good faith, once described in the belief that each was new to science – *Belomitra paradoxa* Fischer, 1882; *Jumala brychius* Verrill & Smith, 1885; *Pleurotoma climakis* Watson, 1886; *Bela guernei* Dautzenberg, 1891; *Clionella conspicienda* Locard, 1897; *Clionella costulata* Locard, 1897; *Clionella delicatulina* Locard, 1897; *Belomitra fischeri* Locard, 1897; *Belomitra lyrata* Locard, 1897; *Belomitra major* Locard, 1897; *Belomitra minor* Locard, 1897; *Clionella minor* Locard, 1897; *Belomitra spelta* Locard, 1897. Poor old Locard – sad to see so many of his so-called new species subsequently rejected. Oh, and *Belomitra* Fischer, 1882 has its share of synonyms, too, not just *Dellina* Beu, 1970, but also *Pleurobela* Monterosato in Locard, 1897, *Bathyclionella* Kobelt, 1905, *Cryptomitra* Dall, 1924, and *Morrisonella* Bartsch, 1945.

But I don't think we've heard the last of *Belomitra* – and, who knows, we might see *Dellina* rearing up again! The genus *Belomitra* appears to me to be particularly controversial, in itself, so far as the identity and variability of its contained species are concerned: of *Belomitra torquata* (Barnard, 1963), known only from off South Africa, Bouchet & Warén (1986: 472) state: "The specific status of this short-spined form of *Belomitra* is uncertain. It may finally turn out to be a form of *B. pacifica* or *B. climacella* ..."; of *B. pacifica* (Dall, 1908), these authors state: "The material available is not sufficient to show complete transition between the various forms named, but the known variation of *Belomitra quadruplex* (Watson) is the North Atlantic (Bouchet & Warén 1995) makes this synonymy probable.; of *B. pourtalesi* (Dall, 1881),from the tropical West Atlantic, they state: "We have kept this species distinct from *B. quadruplex* although we have very little evidence to support this ... we have not seen W. Atlantic material from bathyal depths connecting the abyssal form of *B. quadruplex* with the shallow bathyal *pourtalesi* ... There is probably a single bathyal or abyssal N. Atlantic species, and *pourtalesi* is the oldest of the 13 available names." And of *Belomitra richardi* (Dautzenberg & Fischer, 1906), from off the Cape Verde Islands, they note: "*B. richardi* has not been found since the original description and we have not been able to decide whether it is a valid species or only a local form of the variable NE Atlantic *B. quadruplex* ..." There ! That gives you some idea of the tangles of taxonomy and the slough of synonymy ...

And all this simply because I wanted to know what had happened to *Dellina* Beu, 1970!

So, now, we have *Belomitra climacella* Dall, 1895, listed as a member of our fauna, in the family Buccinidae/Buccininae (Spencer & Willan 1996: 26) to remind us, at least, of how convoluted molluscan taxonomy can be. Perhaps the final word is yet to come ... watch this space!

Φ Φ Φ

3 which, apart from those involved in the *Waipaoa* story, include, for instance, *Pagodula delli* Beu, 1967) [originally described in *Vesanula*], *Poirieria delli* Maxwell, 1971, *Pseudotindaria delli* Maxwell, 1992, and *Striocadulus delli* Marwick, 1965 [originally described in *Cadulus*].

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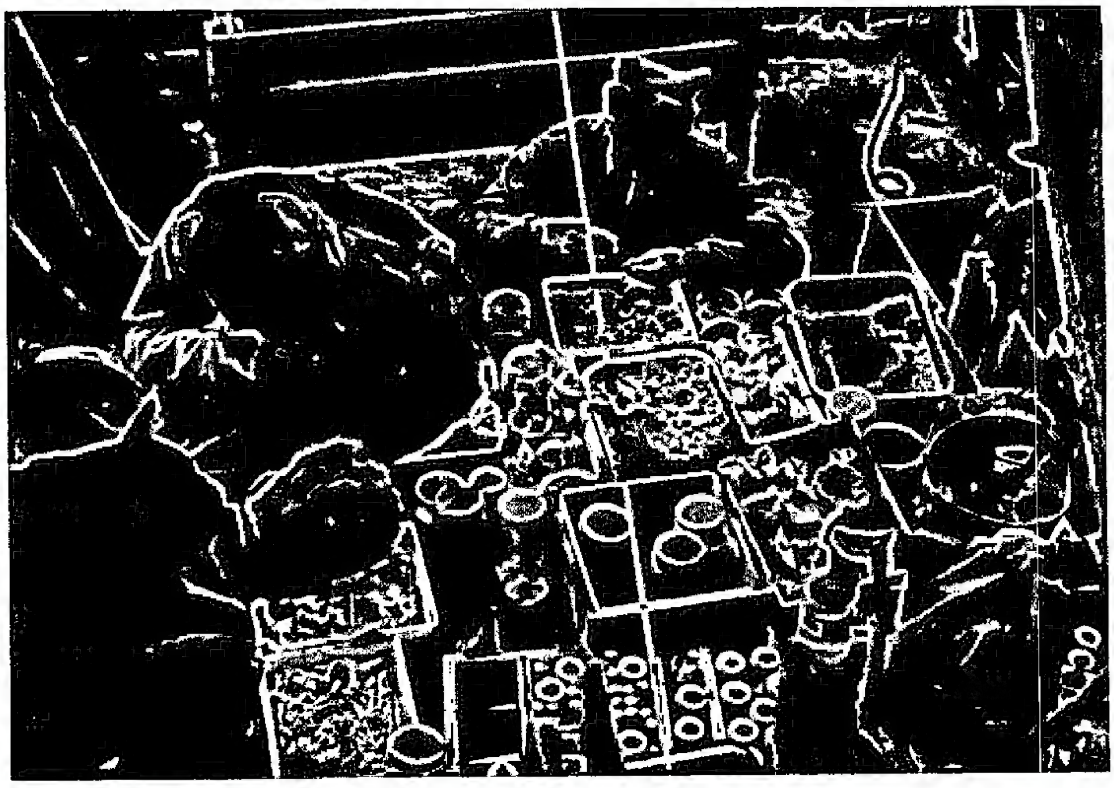

CHATHAM ISLANDS 1954 EXPEDITION: Station 6, 403 metres, 43° 40'S, 170° 29'E, Chatham Rise, 24 January 1954.

Sorting the catch from a 56-foot beam trawl haul on the afterdeck of the m/v *Alert*: from the left - John MacInytre, Ray Forster and Dick Dell.

Photo: Daphne Marshall

THE PRESENT STATE OF KNOWLEDGE OF THE SYSTEMATICS OF NEW ZEALAND MOLLUSCA

By R.K. Dell

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In 1919 Charles Hedley in his obituary notice of Henry Suter, wrote, "Perhaps at no time did Suter quite realize the undiscovered residue of the fauna on which he worked. In his various reviews and revisions and supplements he wrote as if he had in hand if not all at least almost all the species of the area under consideration." I wonder how often various of Suter's successors have felt much the same as he appears to have believed, and how equally far from the truth we all have been. The production of Suter's Manual in 1913 was one of the great landmarks in the study of mollusca in New Zealand. Perhaps a little old-fashioned even when it was produced, it provided a magnificent baseline which was still unavailable in most other countries. There can be little doubt that the Manual stimulated work on molluscan systematics in New Zealand to a much greater degree than almost anywhere else in the world. Amateur collectors may well not realise that it is quite unique for a country of our size to have produced within fifty years a line of workers on mollusca of the status of A.W.B. Powell, J. Marwick, H.J. Finlay, C.R. Laws, C.A. Fleming, W.F. Ponder, A.G. Beu and F.M. Climo, quite apart from the many others who have held professional posts, or who have studied biology, ecology, and anatomy rather than systematics.

The Plates to the Manual did not appear until 1915, and in the same year Iredale's Commentary was published. Suter himself, did not appreciate this criticism of his nomenclature, although Iredale's introduction was full of praise for the Manual in general. Critical it may have been but it was written in the true spirit of science, pointing out what was wrong and adding new information. But the Commentary was only the first of a series of works which were to advance our knowledge of systematics on two fronts.

Firstly collectors and scientists began with increasing tempo, a much more concentrated attempt to collect our molluscs more widely. More concentrated collecting and better geographical coverage meant that our shorelines were better explored, especially for smaller molluscs. Then using any method possible for them they extended their collecting out on to the Continental Shelf and in harbours covering depths from about 10 to 80 or so fathoms. The new species discovered began to be described in a steady stream.

Secondly scientists began to look much more closely at the classification of our molluscs. Before this, there had been a tendency to use "wide" genera for our New Zealand shells. The best documented areas in the world for molluscs were both sides of the North Atlantic and European seas, together with the copiously illustrated European Tertiary faunas. It was these areas that New Zealand workers had looked to find genera which would fit New Zealand forms. Under Iredale's influence at first, but with H.J. Finlay leading the field later, critical comparisons made between these Northern Hemisphere genera and our southern species, showed that these Old World genera could no longer justifiably be used. As work continued on our Tertiary fossils, it became obvious that many of our New Zealand genera had long lineages through the Tertiary. From this it was argued that many of these genera had in fact evolved in the south and that a large proportion of our molluscan genera were probably endemic. If comparisons were necessary, one need hardly

look further than Australia where many new forms had been described and figured by Hedley, and more were now being recognised by Iredale. At the same time scientists began to recognise that species varied from north to south and the use of subspecies and trinomial nomenclature began to be used for molluscs in this country.

The appearance of Finlay's large "Commentary on New Zealand Molluscan Systematics" in 1927 indicated the great advances in knowledge, but even more the great difference in outlook that had occurred in the short twelve years since the appearance of Suter's Manual. The "Further Commentary" must rank as the second landmark in this survey of our recent history. Many of my own generation of collectors and students of mollusca started with the only popular book on New Zealand shells available to us, C.E. R. Bucknill's "Sea Shells of New Zealand". Bucknill's introduction lead us back to Suter's Manual, still available in those days very cheaply from the Government Printer. The road to Finlay's "Further Commentary" was a harder one to find in those days, but when we met up with it, the enormous advance it represented was obvious.

But progress continued at an increasingly faster pace. Marwick's revisions of Tertiary and Recent species dealt with family groupings, Struthiolariidae, *Glycymeris*, Volutidae, Naticidae, Veneridae etc. and laid a firm basis for the systematics of many of our common species and demonstrated their Tertiary ancestry. Above all else, however, the work of A.W.B. Powell showed both the extent of the additional material which was being collected, and the amount of critical systematic evaluation required. His first scientific paper was published the year after the writer was born, and he is still actively working. It would be unkind, perhaps, to consider a person as a landmark, but undoubtedly several of his major works could be considered as such. And there could well be arguments whether the major one should be the long list of additions to the fauna which he has described, the discovery and description of the range of subspecies of both Paryphanta and Placostylus, his work on the Turridae, the indication of the wealth of small species living off the Three Kings, or his fathering of the Auckland Museum Conchology Club which in turn produced several generations of scientific workers on mollusca, and untold numbers of serious amateurs. History will as usual be the final judge in such matters. But the writer believes that it is the production of "The Shellfish of New Zealand" in 1937 and itas subsequent editions up to "Shells of New Zealand" in 1957 which supplies our third molluscan landmark since Suter. As someone who has personally and literally worn out several copies of each edition both as an amateur and as a professional, I may be biassed in believing it was a godsend to us all. The complete checklist of New Zealand mollusca which it contained together with the key to all the complex literature since Suter's Manual, the useful general introductory chapters and the ever increasing number of illustrations provided, each filled the needs of a different user. In lieu of a new Manual, the serious student now had easy access to the maze of literature.

The pre-war period had been largely dominated by the Finlay-Marwick-Powell trio. After the war a new generation began serious studies of molluscan systematics. At that stage we might well have been excused had we considered that our fauna was fairly well known, and that all we needed was some concentrated work on classification, and some sensible revisions of a few difficult groups. After that was finished we could get on with other studies in distribution, biology and ecology. Just how wrong we would have been, events rapidly showed us.

The first really significant post war development came as one result of the growth of oceanography. Stimulated by the visits of overseas oceanographers to the 7th Pacific Science Congress in early 1949, the arrival of the survey ship HMNZS "Lachlan" towards the end of 1949, the visits of the British oceanographic vessel "Discovery II" in 1950/51 and of the Danish "Galathea" in 1951/52.

New Zealand marine scientists began to organise expeditions with the ships available to them. The first of these, the Chatham Island Expedition, working from Mr A.J. Black's 72 foot M.V. "Alert", was successful in working trawls and dredges down to depths of 330 fathoms. This expedition and subsequent work carried out from the "Alert" and other small ships particularly in Cook Strait and off Otago brought to light a completely new molluscan fauna off the edge of the Continental Shelf. The writer was fortunate in being able to accompany some of these expeditions, and wrote up the mollusca in a review of the archibenthal fauna. Subsequent work has shown that we still do not know the limits of this fauna and new material comes to light in almost every haul from deeper water.

The New Zealand Oceanographic Institute was formed in D.S.I.R. in 1954, and has carried out an immense extension of biological survey work on the Continental Shelf and beyond. Much of the molluscan material obtained has not yet been described or written up. Four universities have established marine biological stations, and two of these have sea-going research vessels attached to them. Deep water investigations have been carried out in Cook Strait by the Victoria University of Wellington, and off Otago by Portobello Marine Biological Station. The Fisheries Division of the Ministry of Agriculture and Fisheries also maintains its own research vessels which collect mollusca, amongst other animals, from many parts of New Zealand in the course of fisheries investigations.

The National Museum has organised expeditions to many parts of New Zealand using particularly Mr Black's "Alert" and her replacement, R.V. "Acheron". In the course of this work mollusca have been obtained from the Auckland Islands and the Antipodes in the south to the Kermadec Islands in the north, in depths down to 830 fathoms. The large collections obtained have still only partly been described. To give some idea of the wealth of material still to be described, five dredge hauls off the Three Kings have produced somewhere in the order of 100 new species.

Together with this extension of collecting into deeper water there have been several other trends which have particularly affected work on systematics.

1. *Intensification of General Collecting.*

Besides the work in deeper water over the last thirty years collecting in general has continued to expand. This is the area in which the amateur collector has played such an important part. Interest in shell collecting and the study of shells has spread throughout the country so that collectors can now be found in most settled areas. Every year their efforts bring to light new information on our molluscs. The list of new species and new records which have resulted from amateur collecting and interest would be long indeed. Even more importantly, perhaps, their observations indicate changes or additions to the fauna such as the recent invasions of *Theora lubrica* and *Limaria orientalis*. Nor are the amateurs any longer confined to the intertidal. Many collectors have carried out quite intensive dredging campaigns and have organised commercial fishermen to bring in regularly the interesting species from their catches. The use of diving gear particularly SCUBA has shown completely new facets to our fauna, especially from rocky areas where other methods of collecting prove impossible.

It would be unfair to try to name major contributors by name. Mention might be made of two collectors, neither of whom, because of physical disabilities were able to collect their own material, and yet managed to put together significant collections in fields in which no one had previously worked. The late Gordon Williams pioneered the extraction of shells, particularly small species from fish stomachs in the Bay of Plenty (his collection is now in the Auckland Museum). The late Mrs Elsie Smith working largely in isolation at Half Moon Bay worked at

extracting small molluscs from shell sand samples brought in by fishermen from around Stewart Island and put together an extremely large collection from that rich area (her collection is in the National Museum). In many areas of science the part that amateurs can play in adding to knowledge has become severely restricted. In a country like New Zealand the amateur's role is certainly as important as ever, especially if the collector notes reasonable data with his specimens.

2. *Anatomical Investigation.*

Careful investigation of the external features of the animal, study of radulae, gill structure and arrangement in bivalves, and of the genital apparatus especially in land snails has completely revised our idea of the classification of major groups of our molluscs. The work of W.F. Ponder on rissoid-like forms and that of F.M. Climo on our smaller land snails are good examples.

3. *Study of Variation.*

The much more extensive collections that now exist both within museums and elsewhere, and covering most of the New Zealand region has allowed much better evaluation of the extent of variation present in our molluscs. Some studies have already been published e.g. Ponder's work on *Buccinulum* and *Xymene* and Tucker Abbott's study of *Xenophalium*. But almost all the large families and genera of New Zealand molluscs require this kind of critical evaluation.

4. *Critical Examination of Generic Classification.*

With greater ease of travel it has been possible for local workers to visit overseas museums and to study material related to New Zealand molluscs. Some restrictions have been eased regarding the loan of types and other material from overseas museums. In addition our collections of overseas molluscs held in New Zealand have increased markedly. Our New Zealand literature resources on the molluscs have been developed steadily since the war and the ease with which rare papers can now be copied means that we have access to literature which did not exist in New Zealand thirty years ago. As a result it is now possible to undertake many more critical studies of the supra-generic classification of our fauna. Powell's studies on the Turridae, Cernohorsky's on the Mitridae, Marwick's on the Turritellidae and Beu's on the Cymatiidae are examples of this type of work, which is placing our molluscan nomenclature on a much firmer basis and allowing critical comparisons with overseas faunas.

5. *Better Understanding of our Tertiary Mollusca.*

Fleming's work on Tertiary faunas continued the earlier studies of Finlay, Marwick and Laws, and the younger generation of paleontologists including Beu and Maxwell have extensive studies in hand. This work on fossil mollusca throws a clearer light on our recent fauna and aids in understanding its development. New Zealand has been fortunate in having such a series of fossil beds covering in sequence all the main sections of the Tertiary. We are even more fortunate in that so many of our scientific workers have studied both fossil and living forms. Neither feature is usual in other parts of the world and the advantages to molluscan systematics have been quite outstanding.

All these different approaches have resulted in great gains to our knowledge of New Zealand mollusca since the publication of Suter's Manual. The tempo of advance seems to be ever increasing as new techniques and new attitudes and the results of more intensive training are all brought to bear. But finding one's way through the maze of literature produced has once again

begun to prove difficult for amateur and professional alike. So many new species, so many rectifications of nomenclature, so many name changes and new records scattered through papers published in a wide range of journals, papers which if they can be brought together take up many feet of shelving! For some time now we have needed a synthesis and fortunately this synthesis will soon be available to us in the shape of Dr Powell's new Manual. Those of us who have seen parts of this work in the course of its production are confident that its appearance will stimulate even more effort to make our molluscan fauna better known. This time none of us, least of all its author, will feel that this synthesis will deal with our total fauna, nor that it will represent the last word in knowledge. The best qualified among us, after a very long working life on the group, has called a temporary halt, long enough to face a major consolidation and evaluation. Who can will be a major landmark in progress.

What then may lie ahead? We have just seen the discovery of a subterranean fresh water molluscan fauna, collected largely by the Entomology Division of D.S.I.R. in the course of other investigations, and described by Dr Climo. We must surely expect that other new habitats will come to light. There are enormous deposits of subfossil land snails from cave deposits now ready for detailed study. The results of this work will undoubtedly change our ideas of land snail evolution here in New Zealand. The major trends in post war invesigations will all undoubtedly continue. Perhaps the quite definite invasion of our northern waters by tropical and subtropical forms will increase, perhaps it will diminish and even vanish. The recording of this invasion and its ultimate fate will provide much of scientific interest in showing how our fauna has changed in the past, and this will assist us to understand similar happenings in the Tertiary.

One new technique alone will undoubtedly change our methods quite drastically and supply a new insight into molluscan relationships. Workers in this country as well as overseas are increasingly using the Scanning Electron Microscope (SEM) both as a research tool, and as a method of illustrating systematic papers. The basic technique is relatively simple once mastered, the machine used extremely complicated and expensive. Several of the machines are being used by workers on mollusca in this country, including three microscopes in Wellington. In practice the specimen to be examined is coated in metal and then photographed as magnfications within the range of X20 to X10,000. Not only is higher range of magnification much greater than is possible with a normal light microscope, but the depth of focus, even at low magnifications, is much greater than is possible with any other technique. Thus photographs of small shells a few millimetres across show much more detail than has been possible before. Under high magnifications the minute sculpturing of the protoconch or interstitial ornamentation is revealed in detail which just cannot be seen under light microscopes, much less photographed. Structures like the radula can also be photographed to give a three dimensional effect which light microscopes cannot produce. The results gained from the use of the SEM represent a great technical advance in the study of shells and of radulae. By showing details which cannot be seen in any other way these photographs allow critical comparisons between allied forms which were not previously possible, and reveal a number of new features which will obviously be useful as systematic characters.

The use of the SEM is already beginning to revolutionise the practice of systematics and the method of illustrating scientific papers. The change is already dividing systematists into two distinct groups, those who have ready access to an SEM, and those who do not. The division will be most marked with people studying the smaller species although it will also arise in the study of radulae. Those scientists who cannot gain reasonably regular access to an SEM will be placed at a great disadvantage over the next decade. A comparable situation would arise at present if we were to deprive most workers on mollusca of both light microscopes and cameras and leave them yu

using hand lenses alone. Because the cost of an SEM is so astronomically high the "have nots" will be placed in a hopeless and an unfair situation.

Increasing use of the SEM in a group like the mollusca must also mean eventual changes in systematic practice. Up to now the basic specimen used to determine the identity of each described species has been the holotype. This is a single specimen for each species which is normally carefully preserved in museum collections. While all modern systematists recognise that the holotype is only one example of the species and represents only that part of the variation to be expected in the species in life, it still remains the final arbiter of the identity of that species. Most descriptions of new species are accompanied by a figure, almost invariably of the holotype. The specimen which is figured by the SEM is coated in a thin layer of metal. The specimen may later be cleaned off although this is not an easy process and may damage the specimen. In practice it is usually retained as a gold-coated replica of the original specimen. Because the holotype should be retained in its original condition, scientists have not yet had the nerve to photograph the holotype under the SEM. Thus systematists who use SEM photographs to illustrate their new species may well have to also publish a photograph or figure of the holotype made by traditional means as well as an SEM photograph of a paratype. The difficulty may still arise if the holotype and figured paratype prove to belong to different species (it has happened often enough in the past). On the other hand SEM photographs are so perfect that the need to refer back to the holotype will almost disappear.

An additional problem which will arise will concern the identification of other specimens if the original description is illustrated with an SEM photograph alone. The generic placing of some species may well depend on details (of the protoconch for example) which are just not visible under the light microscope. It would be extremely tedious and impracticable if all specimens which need to be identified had to be coated and photographed under an SEM. Obviously if scientits use details visible only under the SEM for classification, they must also try to give us other diagnostic characters which we can all see under a light microscope.

It will undoubtedly be necessary to draw up new ground rules for systematic work if this neqw taxonomic tool is to be properly used. Many of the difficulties would become less pressing when Electron Scanning Microscopes become simpler and therefore cheaper, and so more readily available.

[*Editor's note*: The article was finished off with seven SEM photographs taken by Bruce Marshall "given here to show the kind of results that are possible." And the author added: "Even with the difficulties that must arise, one can only conclude that the SEM will open new windows on our study of molluscan systematics." And indeed it has – as testified by the many fine photographs (and their interpretations) that Bruce has published over the years since this article – which anticipated difficulties that have since been generally well resolved – was written. Who can recall when computers first appeared in our work places? Our fear of them – and the cost ?]

The Day of the Waves : Wellington Harbour, February 2002

By Jenny Raven, Trix Hennessy, & Kris Woods

6th February, Waitangi day, 2002 saw huge seas hit the south Wellington coastline. The day was reasonably fine with a strong southerly wind; nothing too unusual for Wellington but a major depression south of Cook Strait combined with southerly winds and exceptionally high tides created the huge seas. Several members of the Wellington Shell Club witnessed the event and in the succeeding days scoured the southern coastline to see what the waves had brought ashore. Here are some of their stories:

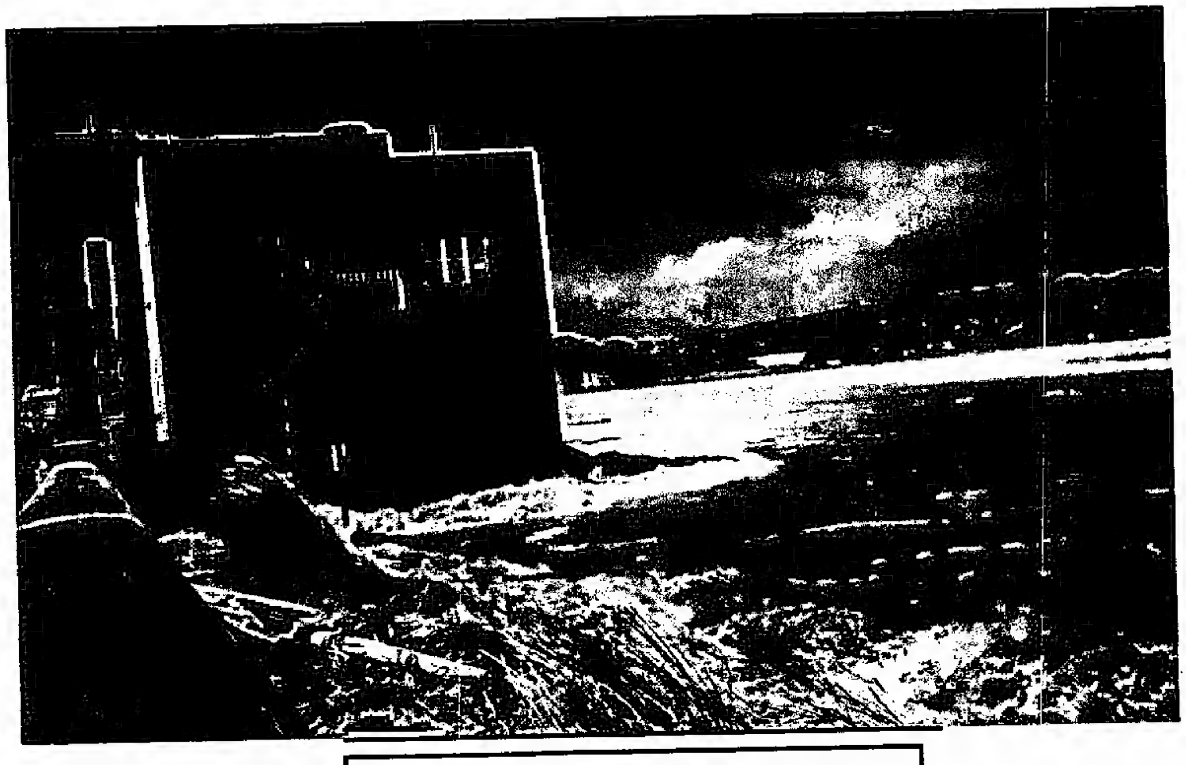
Jenny's story –

Waitangi day saw me flying into Wellington airport from Dunedin about midday. As we flew in over the southern coast I could see that the seas below were mountainous, a mass of white foam. Coming in over Wellington harbour, Evans Bay was also a mass of waves with wind surfers zooming everywhere and then as we taxied to the southern end of the runway I could not believe the huge seas I saw crashing over the breakwater at the far end of the runway. Lyall Bay on the right hand side was virtually unrecognisable. There was no beach and the sea was up to the sea wall. The bay was a mass of huge waves and white foam.

When I was met at the airport all I could say was I had to get down there. I knew this was something out of the ordinary! However dropping luggage off was a first priority. My house is about ten minutes away, on top of the hill overlooking Barrets reef and the harbour entrance. The sea was a great sight. Waves from far out were surging into the entrance. The gravel beach at Breaker Bay below the house was no longer - the waves were hitting the hills at the back of the bay and coming up and over the road. Cars were getting a drenching. The doors on a boat shed below my house were getting pounded and two dinghys started getting washed into the sea till rescued in time by members of the public.

South End of Lyall Bay Beach 6 February 2002.
Usually there is a sandy beach in front of these houses.

For about half an hour I videoed the scene. There was something new to watch every few minutes, then it was time to get into the car and investigate the scene at beach level. We headed through Kilbirnie to Lyall Bay. Lyall Bay faces directly south and seemed to be getting the full force of the waves. I parked a safe distance and gingerly approached the beach. Waves were coming up the steps to meet us and hitting the sea wall in between. The surf clubs were getting a pounding, as were the houses that backed onto the sea at the south end of the beach. I grew up at Lyall Bay and recall the same event happening there in the 1960s; also then a sunny day and huge waves attacking the sea walls. Older children were diving off the sea wall into the sea and what was usually an extensive sandy beach. Today was no different. The dunes had mostly gone – wood and rubbish swirled around in the surf and the waves on hitting the seawall backed into the following one to create a bigger surge.



Lyall Bay Beach 6 February 2002

Later that evening it was low tide and I ventured back on my own to Lyall Bay beach. The bay was still a mass of waves but they were now breaking further out; about every tenth one would still come up to the sea wall. In between these extra big waves you could stand, at least for a few minutes, on the sand on the seaward side of the wall. I stood on the wet sand and surveyed the rubbish and shell material strewn about. There looked to be a lot of shells but this was not the time to start shell hunting. Beside me on the wet sand stood a large brown gull. I imagine he was a bit dazed. He kept looking at me not wanting to fly away. I was sure if he could talk he would have an exciting tale to tell of what he had witnessed that day. I was still looking at him when suddenly there was the "whoosh" of an in rushing wave and I fled up the steps with the wave following. I looked back over the sea wall and the gull was nowhere to be seen. It was now getting dark so any shell collecting would have to be tomorrow.

The next day was fine. The seas had died down and at low tide in the evening I was back at Lyall Bay after work. Yes, there were shells everywhere. Nothing initially that looked different to the

usual Lyall Bay material. However it did not take long to see the extent of the devastation. Pauas, both *Haliotis iris* and *australis* lay cast ashore still in their shells; many floating creatures had been flung up on the sand. I wondered what the huge white slugs were till I realised they were *Scutus*, somehow turned white and with the shield shell still on its back. Usually a jet-black slug these poor creatures had obviously met with a violent death once the rocks they live under had been moved by the waves. Other shells to suffer mass destruction were the bivalves that live just under the surface - *Pseudarcopagia disculus* and *Protothaca crassicostata*. I threw several live ones back in the water. Large numbers of empty *Trochus tiaratus* and *Amalda australis* littered the shore.

Over the next week I wandered this shore several times. I came across other Club members looking for shells. I was thrilled to hear that two *Trivia merces* were found by Club members near the foot of the steps at the south end of Lyall Bay. A foreign cowrie and naticid were also found there. Three *Trivia merces* have now been found in the Lyall Bay area in the last two years (Raven/ Hennessy/ Woods) adding to one found about 1990 by Bevan and Barbara Dunn so it is now more likely they are actually living in the area. Lyall Bay comprises a mix of gravel and sand at the south end, which is the same type of beach they are frequently found on at Mahia and places further North. My best find at Lyall Bay was a couple of very nice *Gari convexa*, cast in alive with both valves intact. This *Gari* is rarely seen in Wellington.

For several days it was well worth combing the shore. Interestingly, Lyall Bay was the only area on that side of the harbour to receive noticeable wash-ups. The normal shell sand area at Princess Bay was swept clean, devoid of all shells. However on the other side of the harbour good wash-ups occurred at Eastbourne and several Club members made interesting finds among the wash-ups there.

Trix's story –

This year we had no summer. It poured with rain day after day. Motorways sent up great sprays. Wellington harbour was brown with runoff and roses rotted in the bud. In February came a great series of southerly storms. The ferries both at Picton and Wellington scurried back to safety. Thirteen metre swells. Passengers were angry – their holidays ruined. Why they wanted to plunge to the bottom of Cook Strait in a great iron coffin of heavy cars and road transporters was beyond me.

On Waitangi day my neighbours returned "goggle eyed" from a nice, quiet drive. The roads around the South coast were impassable - seas over the roads, the seawalls and into the garages. "Dozers" spent the next few days clearing boulders, gravel and kelp to open a tortuous track – and I went out to Eastbourne- shelling!

There is a small carpark where the street forks just before Eastbourne (known to the locals as "Windy Point"). " You'll never get near" said the old man walking his dog " we've had to put up with the stink for days". At the little concrete slipway *Perna canaliculus* as big as your feet were thrown in piles of knee-high fractured stench. There was little else, so I drove on and parked under the pines by the Eastbourne wharf. Under the wharf and along the first curve of the beach south there were two excellent tide lines to prospect.

The storms had barely hit the tussocks here. This beach usually has little to offer other than *Myadora striata*. Oddly the greater force of the sea, the bigger the shells flung up but the usual ones were missing. The storm had dredged the harbour bottom further out, flinging up small boulders with the holdfasts and weed. Huge *Perna canaliculus* with strings of *Tawera spissa*

attached, lots of *Turbo smaragdus* and whole pairs of lovely little teacup sized *Pecten novaezelandiae;* all in a terrible roll of stones and protruding shells. There were Psammobiidae, usual to this coast, both *Gari lineolata* and *Gari stangeri*, but also pairs of *Gari convexa* brilliantly coloured, but when freed from the wreckage usually with one side smashed in. I retrieved a dozen intact pairs. There were a few tatty *Haliotis iris* and *Haliotis australis* intact with shrivelled fish; a few *Talochlamys zelandiae* dull coloured and with edges broken. I found a juvenile *Xymene ambiguus* and finally a small, bright pair of *Tucetona laticostata.* A very good day's outing!

Ten days later I was back on the beach at Eastbourne like a hopeful seagull checking for stranded kahawhai. It was a beautiful day – a warm breeze, sunshine and a low tide like green glass with little wavelets barely bumping the shore. I didn't expect anything new. There were no shells at the tide's edge, only little clumps of fresh green weed dotted along the sand, so I ploughed along the high tide line. The dangling strings of *Tawera spissa* were still there but none today showed the wonderful geometric patterns. Most things were lacklustre and bleached. The *Perna canaliculus* were fewer and cleaner- thank goodness!

In the distance I saw an Indian man, mid thirties, bend and pick up something white at the tide's edge. He was looking at it totally puzzled. I'm hurrying towards him, frantic he will toss his find away. " Congratulations!" I yell at the top of my voice. Catching up I see it is indeed an *Argonauta nodosa* and explain about the *Argonauta* and the inhabitants that build egg baskets. His beautiful, midsize *Argonauta* has only a small break on the back. "People search for years and never find one" I tell him. He beams – "Now I know the story, I'm taking it home" he says. He made my day too. I was so happy for him.

Kris's Story –

On 6 February 2002 , I was happily ensconced at home, blissfully unaware of the spectacular event unfolding on the southern coast of Wellington. My daughter Merrin , with her usual aplomb, bounded upstairs mid afternoon, proclaiming that Lyall Bay was being thrashed by the hugest of waves. All this was relayed through her boyfriend's cellphone. He's a very keen fisherman and had been witnessing the scene for several hours. I only hoped he wasn't contemplating casting a line into the wild seas.

This was something not to be missed. Merrin took off at speed with her friend and Roger and I were close behind. The sight that met us at Lyall Bay was truly breathtaking. Towering, crashing waves and a vast expanse of the whitest of foam. Along the coastline, from Lyall Bay to Island Bay (we could go no further in the car) nature was in full force and incredulously more than the odd person was standing well out on the rocks, amidst all the fury. Thankfully Merrin's boyfriend was not one of these " brave" souls.

I really wanted to be out of the car, to hear the pounding of the waves and to be enveloped by the excitement. We stopped at Houghton Bay and at a safe distance, took it all in. I just couldn't miss the opportunity for a superspeed shell grovel (well I am a shell collector after all and we must be true to our profession !)

The thought of what treasures may have been tossed up by these monstrous waves consumed me and three days later Roger and I ventured down to the southern end of Lyall Bay Beach. To be more truthful, it was Saturday night, we were supposed to be going somewhere else and it was getting dark. However, I had waited three days to hit the beach and the threat of darkness did not deter me. The "somewhere else" would have to wait. What's more, I wouldn't be competing with

other shellers! In less than half an hour, before darkness forced me to drag myself off the beach, I'd gathered a good selection of shells. There was indeed a significant wash-up. Amongst others, were large numbers of *Amalda australis* (empty), *Pseudoarcopagia disculus* and *Zethalia zelandica.* Darkness was upon us and by now I was barely able to discern shells from stones. As I approached the steps up to the road I stooped for one last fossick. To my absolute amazement I uncovered my first ever *Trivia merces* and my eyes were on stalks. It took me back to a Club field trip at Mahia , where a group of us were sitting at Aurora Point sifting through the gravel and sand. Everyone except me were finding *Trivia* and I was feeling very miffed. This finally made up for that day. My *Trivia merces* is twice the size of the Mahia ones, even if it does have a small hole. There's no way I going to put that on the Club trading table. This Lyall Bay venture had to be the quickest and darkest yet for me but definitely one of my most gratifying to date.

Inspired by the previous night, I returned to the same spot at low tide on Sunday, to be greeted cheerfully by two fellow Club members, Pat and Graham. They were also out to see what the storm had brought up. I collected mostly under and near the southern wall. To be found in abundance were *Tanea zelandica, Trochus viridus, Trochus tiaratus* (the latter two species all empty) and *Cantharidus purpureus.* I also uncovered several small, but quite presentable, *Cookia sulcata,* an intensely blue *Haliotis iris* and a handful of attractive *Haliotis australis.*
I returned twice during the following week, the second time walking from the southern end to the Lyall Bay Surf Club. I knew I wouldn't venture past the Club as just beyond was a large group of exuberant school children and this being my day off from teaching, I wasn't tempted by the sight. The wash-up was still significant but largely the shells were worn or broken. There were countless *Myadora striata* (not one pair amongst the lot), some *Argobuccinum tumidum,* unpaired *Pecten novaezelandiae, Divaricella huttoniana,* a good *Gari lineolata* and several unpaired *Gari stangeri.* As I walked back to the southern end, shell numbers increased. The beach was littered with attractively-coloured *Amalda australis , Tanea zelandica* and *Sigapatella novaezelandiae. Cantharidus purpureus* were still in abundance. During this visit, two large bulldozers accompanied me, scooping up mountains of seaweed and dumping it against the seawall. Their task seemed endless.

A week and a half later Merrin was making one of her many proclamations again. She'd been fishing with her boyfriend at Makara . They were walking back to their car when she noticed a "white thing" poking out of the sand nearby. On investigation, she uncovered an *Argonauta nodosa*! Her immediate priority of course was to ring mum and gloat. "I'll sell it to you mum, no, no, I'll take it to the auction house" she declared. When I finally got to see the nautilus, it was as stunning as she'd described - big, very white and with good spikes. A grand find indeed!

A day later, with Merrin calling out "you won't find one mum", Roger and I drove to Makara. She was right and I knew I'd have to put up with the "I told you so" later. I did find a couple of attractive *Haliotis iris* and it really was a pleasant evening. Picture this though - Roger had taken his mountain bike and met up with me at the gun emplacements. "Jump on" he said "you'll get back faster". Well, I can honestly say I have not been on a bike carrier for well over twenty-five years. We must have made the funniest sight, two adults bumping their way back down the stony track to Makara Beach, me hanging on like a limpet whilst trying not to squeal like a pig and the *Haliotis* dancing around in my backpack.

The Woods' post Waitangi Day shell collecting could never be described as fruitless or boring.

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INDONESIA – A CONCHOLOGIST'S PARADISE

By Zvi Orlin

Indonesia is a most attractive destination to the potential tourist. With 6,000 inhabited islands stretching across almost 5000 km, from the Malay Peninsula to the borders of Australia, it is endowed with a fascinating array of flora and fauna. A meeting place of four main religions, of which Islam dominates, and situated on the "ring of fire" (a meeting of tectonic plates), volcanism is evident everywhere, and with a kaleidoscope of cultures, its attraction is hard to resist. The scenery is outstanding, and for us conchologists its situation, bordering both the Indian and the Pacific Oceans, could not be better. I will not burden you with a description of all the beautiful sights, handicrafts, works of art and exotic dance performances I saw, but concentrate on our interest in the mollusc fauna.

In preparation for my trip, the only extensive book I could procure was *Indonesian Shells* by Bunjamin Dharma (two volumes), which has coloured illustrations of over 1000 species, with the Latin names of each and a little information in English on them (size, frequency, habitat); the rest of the text is in Bahasa Indonesian language. I visited three of the main islands: Java, Bali and Sulawesi and travelled extensively for two and a half weeks, searching 23 beach locations, and collected over 1300 specimens of marine shells, which I have started classifying. So far I have found over 350 species, which I am now checking. Dharma's books were inadequate, but fortunately my four volumes on Australian marine shells have been of great help. About 65% of the specimens are gastropods and 35% bivalves. An interesting fact is that 35% of the species identified are also found in the Red Sea, and the literature on those species was also helpful for my identifications

Some interesting details about my finds so far are as follows:

GASTROPODS - the families with the most species were Cypraeidae 27, Conidae 24, Muricidae 21, Neritidae 18, Strombidae 14, Olividae species and forms 12, Trochidae 10, Naticidae 8, Cerithiidae 8, Buccinidae 7, Nassariidae 6.

BIVALVES: Veneridae 22, Arcidae 10, Mytilidae 9, Mactridae 8, Cardiidae 6, Lucinidae 6. All the species of Chamidae (5) and Ostreidae (4) are also found in the Red Sea.

The locations which were most prolific were the Northern Bali beaches, S. W. Sulawesi and S. Java. On one of the beaches of N. Bali I found a pile of discarded bivalves left by the fishermen, mainly Ostreidae and Chamidae and some *Tridacna*. As the lower valves were attached to rocks, they were too heavy to bring back, but I managed to separate one *Chama plinthota* from its base rock and also brought back some fine specimens of *Tridacna crocea*. Two other interesting bivalves that I found were *Hecuba scortum* and *Harvella plicatoria* which I have only seen for the first time. In Sulawesi I also found a few *Hippopus hippopus*, some which were probably brought ashore by fishermen. Often different species of Olives I collected, specimens of all were found in Sulawesi, comprising about 40% of the 26 Olive species shown by Dharma.

Springsteen and Leobrera in their book *Shells of the Philippines* relegate the Philippines as "an insulated biota, with an unusually high concentration and diversity of species, with around 5,000 valid species", which has probably increased in the last 15 years. Sulawesi may well be an extension of this phenomenon, as it is adjacent to the southern Philippines Islands. I was most impressed by the diversity and uniqueness of the species I found there. In Northern Java one of

the locations was distinctive - it was low tide, and on the shores of this muddy lagoon open to the sea, I found many specimens of *Babylonia spirata*, *Pugilina cochlidium*, *Hemifusus ternatanus* and *Natica tigrina*, all which prefer brackish or muddy waters. This was the only location where these species were found.

On my way to one of the beaches in S. W. Bali, on a hill I noticed many terrestrial shells lying on the ground between the trees. I collected some specimens of four species, the most interesting of which is *Achatina fulica* of which one specimen is over 100 mm long. This belongs to the family Achatinidae or giant African snails, the largest known land gastropods, which can reach up to 200 mm. This species is from East Africa and has been introduced by man into India, the Pacific islands including Hawaii, etc. On one of the Sulawesi beaches I also found an additional land species, a specimen of *Amphidromus inversus*, which is sinistral. This belongs to the family Camaenidae, tree-dwelling vegetarians, of which many colourful species are found in Indonesia. It was found together with marine shells, and was probably washed into the sea.

Any reference to Indonesia would not be complete without mentioning, in my opinion, the most distinguished naturalist of the 19th century - Alfred Russell Wallace. This British naturalist was a contemporary of Charles Darwin, and spent five years collecting specimens of fauna in the Amazon. Afterwards he went to Malaysia and Indonesia for eight years in 1854 -1862, and collected 125,000 specimens of natural history (including 7,500 shells) many of which were new species, formerly unknown to science. He was a phenomenal collector with over 1,500 new species to his credit. All those, like myself, who enjoy travelling in remote regions, cannot but admire a man who collected in dangerous and isolated locations. He was confronted by many tropical diseases and earthquakes and had to overcome the draconian task, in primitive conditions, of preparing viable specimens, packing and shipping them back to England from small ports in Indonesia. He surmounted unbelievable difficulties unknown to our century. He was also faced by the monumental task of classifying his collection, in a period when very little literature was available. He even built his own boats to venture between the islands, when no other transport was available. One of his well-known contributions was recognizing a transition zone between the flora and fauna of Southeast Asia and of the Australian region. He demarcated a line, which is called the Wallace Line, that passes between the islands of Bali and Lombok and further north between Sulawesi and Borneo (or Kalimantan, as it is called in Indonesia). Molluscs were among the fauna used for determining this line. Recent research has however established that the border-line of Australian species should be further east of Sulawesi, which has a high percentage of endemic species and a conglomeration from both regions. Wallace is considered the father of Zoogeography. While in the islands he also formulated his theory of Natural Selection in 1855 "On the Law which has regulated the Introduction of New Species" and in 1858 "On the Tendency of Varieties to Depart Indefinitely from the Original Type." This latter paper, which was presented to the Linnean Society of London, explained the principle of Natural Selection in the evolution of species. It was these papers which helped Darwin understand the mechanism of evolution and prompted him to publish *The Origin of Species*, although he never acknowledged the role that Wallace had played in crystallizing his theory, and received all the credit himself.

Returning to our subject of molluscs, I must also mention Professor Albert S. Bickmore, of New York, who collected shells in Indonesia in 1865-1866 on many of the islands visited by Wallace. I am trying to find a copy of his book *Travels in the East Indian Archipelago* (London, 1868). Wallace in his book *The Malay Archipelago* tells of his visit to Amboina in the Molucca Islands where he saw an impressive collection of about 10,000 specimens of marine shells, in which he estimated there were about 1000 species. He recalls that the shells were an object of trade, and that many of the natives made their living from collecting and cleaning them.

I am not a scuba diver and therefore missed out on a wide selection of scuba diving sites, some of which are considered the most interesting in the world. I can only recommend to all of you, my colleagues, to visit this shell collector's paradise. Good shelling!

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[Editor's note: This article was written by one of our newest members, Zvi Orlin, and was published originally in *Triton*, the journal of the Israel Malacological Society, No. 1, March 2000. Zvi thought that, since many New Zealanders visit Bali and other parts of Indonesia on holiday, it could stimulate interest among any of our members going there. Hence, with his permission and that of the Society, it appears here (slightly edited) as a helpful contribution. Zvi is a great traveller, and is particularly fond of deserts (and writing molluscan dittys). 'Zvi' in Hebrew means 'Gazelle" so he also likes to be known as "The Desert Gazelle"! He would be pleased to establish exchange contacts with other Wellington Shell Club members - email: zviorlin@actcom.co.il. We look forward to receiving further articles from our overseas members !].

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CHITONS

Way back in the Paleozoic they originated
But our curiosity is not yet sated,
The Molluscs have many forms
Chitons hardly seem to meet the norms,
How can we describe this quaint creature
Endowed with many a strange feature:
Like small turtles of the sea
Their shield of plates for protection must be,
Enclosed by a fleshy girdle around
Without any arms or a tail
Usually the size of a fingernail;
Its head is small without eyes
But its sense of smell with competitors vies,
And armed with a rasping tongue
The famous radula, sharp and strong;
On its muscular foot it crawls
Feeding on Algae, on rocks it sprawls,
Hugging them with tremendous power
As if they are home, and their bower
In all oceans they are found
Under the stones and rocks on the ground,
Spending their days stuck to their bunks
During the nights scraping their food in chunks.
Existing since early geological times,
Hardy survivors of cataclysmic climes.
What is the secret of their success?
Further study we only can bless!

The Desert Gazelle

DIARY OF A TRIP TO STEWART ISLAND IN APRIL 2002

By Pat Lakeman and Jenny Raven

Pat begins the tale …

Wednesday 17 April
After uneventful flights from Wellington to Invercargill via Christchurch, Jenny and I were on the wee plane to Stewart Island at 1pm and, "yay", I got the front seat next to the pilot. A nice calm flight across with just a touch of rain about. Great to see that funny little airstrip again.

We stayed at Rakiura Motels - on the road between Half Moon and Horseshoe Bays, about 1km from Horseshoe. We had a quick cup of coffee and then, of course, we set out straight away for Horseshoe. A lovely place it is, and so nice to be back there - my last visit (Jenny's too) had been about six years previously. Horseshoe is a big curving bay with rocks at either end and beautiful sand in between. Shells can be found all along it - rolling around in the shallow breakers on a calm day, also buried in the sand at high water, or just washed up.

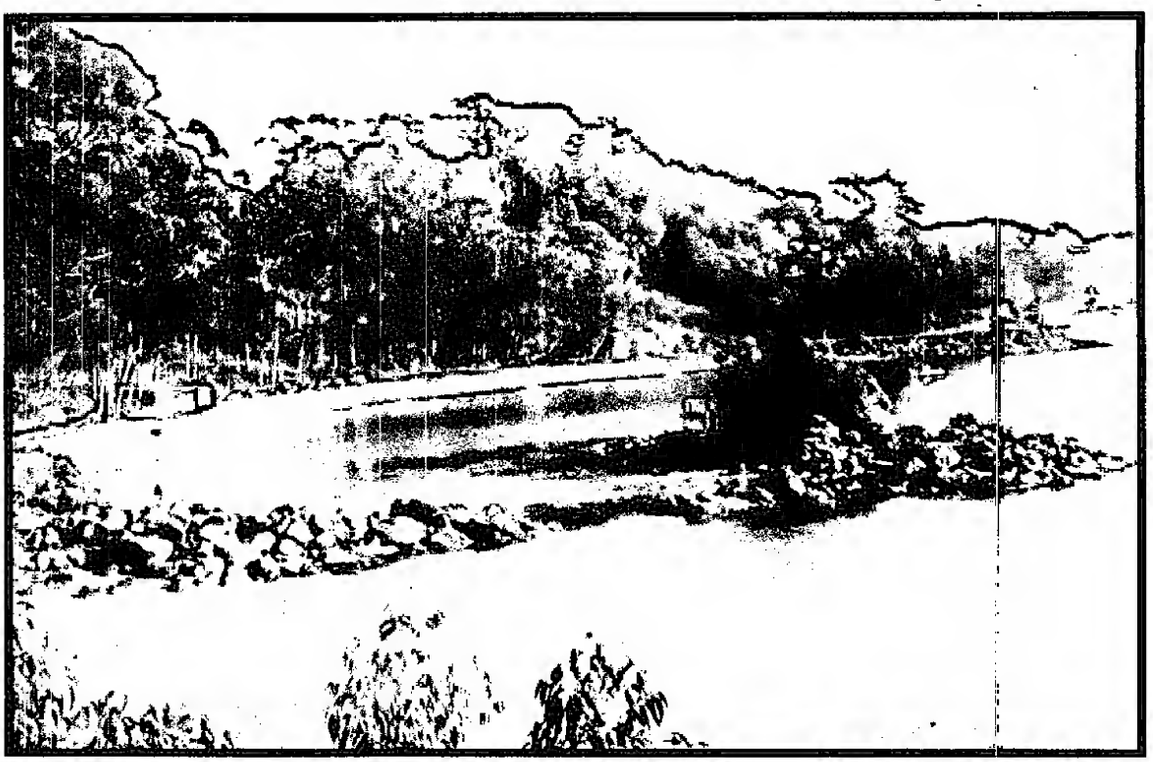
The tide was fairly high by the time we got there, and we walked to the far end and back, not really getting wet but finding the *gigas* form of *Struthiolaria papulosa* washed up live along the low tide line, *Gari convexa* and lots of pieces of very large *Offadesma angasi* which was a surprise because we hadn't recorded them here before. We also found nice *Barbatia novaezelandiae*. By the wharf at the end we saw good-sized fish cruising the water – and we resolved to return the next day with fishing lines and wetsuits to get serious at the low tide around 11.15 am.

Thursday 18 April
We went more or less straight to the far end of Horsheshoe, past the wharf and the breakwater - and into the water about an hour before low tide. Yes, the water was cold; but we did have our wetsuits on. The large white *Buccinulum pertinax* were reasonably easy to find under the rocks beside the breakwater, a few were very large with one dead shell measuring almost 5 cm. We also found *B. vittatum*, and very large *Turbo smaragdus* (albeit a bit encrusted). All of these seemed more prevalent than on our last visit, as did the *Cellana strigilis redimiculum* on the rocks. We didn't see the nice *Lenitrophon convexus* at the end of the breakwater that Jenny had found there five years ago, nor the *Margarella turneri*. Pat found *Thoristella chathamensis* inhabited by hermit crabs – last time Jenny had found them live. We saw live *Haliotis iris and H. australis* – four big *iris* came home with us for dinner – as did a very large kelp-fish that also liked *Haliotis* for dinner – but the bit he ate was on a hook on Jenny's fishing line which she had thrown in off the breakwater before going shelling.

With all that going on we were pretty cold by the time we came out of the water to start the walk back along the beach. Washed up on the way we saw plentiful *Zeacolpus symmetricus* all along the beach, more *Gari convexa* and some monster size *Myadora striata*. We met a woman who has the good fortune to live at the end of the bay, also collecting shells, who told us that Horseshoe is the best beach on Stewart Island for shell collecting.The paua were delicious and not to let the grass grow under our feet we booked a water taxi across Paterson Inlet to The Neck and Cow Island for tomorrow.

Friday 19 April
This beats working in an office. The local shuttle took us to Golden Bay – David Valli whom we had met six years ago and traded some shells with was driving us – and soon we were humming across the serene waters of Paterson Inlet with Ken, our water taxi driver to The Neck opposite Cow Island. Wading ashore through clear water in the sun, there couldn't be a more beautiful place on earth. We walked through the sand dunes to the other side which faces the southern ocean, and saw Cow Island just offshore - water lapping ankle deep to get there, about an hour and a half before the low tide.

Washed up *Haliotis australis* were numerous, though - as often - only a few of the many were in good condition. *Buccinulum vittatum* were plentiful along with *Aulacomya atra maoriana* on low tide rocks at the northern side of the island, and *Thoristella chathamensis* were also live, although we saw only small ones. On the southern side, a good size pocket of shell sand yielded huge *Trichosirius inornata* and *Neoguraleus lyallensis*, plus *Comptella curta* and *C. devia*, *Paxula transitans* and *P. sulcata*, *Thoristella chathamensis* and *Marinula striata* but none of the *Margarella antipoda rosea* we had found on the last trip. We moved onto the southern rocky end of the main beach and scrambled round the rocks to another small beach. The tidal pools were littered with more slightly worn and empty white *Buccinulum vittatum* and *B. pertinax* than I had ever seen. Some large live *B. vittatum* and *B. pertinax* were found, some fresh *Cominella nassoides* with hermit crabs in, and a few large, live *Turbo smaragdus* – not as large or common as at the far end of Horseshoe Bay, or as Jenny had expected to find given the last trip here.



LONNEKERS BAY

I had been lucky enough to find a *Monodilepis monilifera* in a rock pool, and Jenny thought the main beach looked similar to where you can sometimes find *Monodilepas* at Spirits Bay. This

hunch proved correct and with careful hunting at the high tide drift line, we each found several in varying condition, plus some quite nice *Emarginula striatula* along with *Radiacmea inconspicua, Siphonaria propria* and *S. australis*. Back to the inlet side to eat a late lunch and wait for the boat at 3pm, and Jenny found some very nice beaked *Notoacmea pileopsis sturnus*, high in a dark recess in the rocks at the northern end of the beach. Large blue grey lined *Buccinulum vittatum* were plentiful under almost every rock here.

We were a pretty tired pair that disembarked at Golden Bay again, changed into walking shoes for the nearly 4 km trek home, looking at The Fernery gift shop and the Fuchsia Walk on the way. More paua from the day and Jenny's fish of yesterday made a great dinner, and we listened to some of the Blues v. Bulls Super 12 game on the radio (yes, Pat missed her rugby on Sky TV!). We need an easier day tomorrow we decide, so set our sights on Vaila Voe.

Saturday 20 April

Luxury is getting the shuttle van to drop you off at the end of the road, thus saving a walk of around 4 km before starting to shell-hunt! The walk is then reduced to only about half an hour through bush on an easy track, and we got to Vaila Voe too early really, the tide was still quite high. We found large *Lepsithais lacunosus* quite high on the rocks and amongst blue mussels, also small *Alcithoe arabica* alive in the sand (where are the large ones we wonder?) and abundant *Buccinulum pertinax* and *B. vittatum* under rocks on sand, though not many were large. Jenny found one dead and two juveniles of what she would call *B. pallidum* as distinct from *B. pertinax*. Other finds included a dead but recognisable *Cirsotrema zelebori*, nice live *Trochus viridus*, live *Haliotis iris*, live *Talochlamys zelandiae* and *Pecten novaezelandiae*, and a live *Pododesmus zelandicus*,

Then as the tide turned, in front of the stream mouth we found plentiful and very large *Xymene ambiguus* and good-sized *Cominella nassoides* feeding on the cockles *Austrovenus stutchburyi*. Walking back to the township we spotted flat plastic trays piled up on a jetty, and on closer inspection several small *Talochlamys zelandiae* and *T. gemmulata* were amongst the shell debris inside. A well deserved beer in the pub before going home for dinner.

Sunday 21 April

Just had to go to Native Island today because of tides and forecast weather changes. Our new friend Ken the water taxi driver was again our transport, duly appearing on time at Golden Bay jetty. We went via Ulva Island, and in the distance dark clouds were looming. Ken warned he might not get back to this beach later and gave us alternative pick up arrangements just in case. We struggled ashore through the surf in our wetsuits with our packs and pushed the boat back to get Ken away. With a friendly wave he was gone and we were on our own on Native Island. We looked on the beach we were dropped on, and saw *Purpurocardia purpurata* at the high tide line. But not much else, so off we trudged through the dunes to Sandhill Bay. Are we going the right way, asks Pat, as it seemed to take forever – yes, says Jenny following native footprints. We descended onto a pristine sandy beach – we both say "wow!"

The tide was reasonably high so we took photos and photographing a rock, Pat noticed a very large *Cellana strigilis redimiculum*. Plus there were nice *Cellana radians* and some *Notoacmea pileopsis sturnus* up high, and Jenny found a small *Astraea heliotropium* washed up. The tide was too high to look for *Paratrophon patens* on the rock where we had found them on our last trip, so over the sand dunes again to the third beach on the island, which we had never looked at before – nicely sheltered and facing Ringaringa Beach, more or less.

We split up and did an end of the beach each. Jenny found an area of sand meeting lots of rocks, with lots of *Buccinulum vittatum* under the rocks, and she was delighted to find two large, pink-striped *B. pertinax*. Also noted, small live *Margarella turneri* and a medium sized *Turbo smaragdus* (large by Wellington standards), and *Haliotis australis* live, and one or two small *Lepsithais lacunosus*. Rocks were hard to turn here, as they were at the other end of the beach for Pat. Here rocks were piled on rocks in steeply shelving water, so not easy to look in. Further round though, rocks turned into gravely sand, and here there were many small *Buccinulum vittatum* under rocks, blue-lined and white, and under the largest rocks only, some good-sized white *B. pertinax*. Live *Haliotis australis* were again noted just before the dominant species became blue mussels (*Mytilus galloprovincialis*), with just an occasional *Paratrophon patens* amongst them. Also occasionally amongst the blue mussels were green-lipped mussels (*Perna canaliculus*), and half a dozen of those came home with Pat for dinner. Jenny found a large, bluntly spined sea egg that appeared to be a lovely red colour. Then we went back to Sandhill Beach at low tide to look for *P. patens*, but found only a few (unlike the last trip) and noted the blue mussels were less plentiful also.

Returning on the boat with Ken, we admitted to being shell collectors and he was quite interested. Hearing we longed to go out on an oyster dredging trip, but alas knew no oystermen (or women), he said "Would Wednesday do?" and we finished our day with the promise – all going well – of an exciting trip on Ken's oyster boat - and we discover that our friend, Doug Hicks, who has just arrived on the Island to join us, also likes oysters -and so do his uncle and his father who are holidaying here also. We only wanted to bring back shells – but seems we'll need some of their inhabitants as well!

RINGARINGA BEACH

Monday 22 April

A bright, fine and calm day dawns. I hear the door click shut at about 7am when Doug takes off for his morning walk. Turns out to be quite an eventful walk - Doug bowls up to eyeball a sea elephant on the shore which he thought was a dead seal or similar - of the two of them it is definitely Doug who is the most taken aback.

It's a beautiful day, but the low tide is not until around 3pm, so we have time to catch up on chores. A bit of washing is done, shells are cleaned and (Jenny's turbos) boiled – and Jenny also

boiled the beautiful large red kina that she found yesterday. Doug gives up on all this shell-focused domesticity, and heads off to the township to have a look round, also to see his family before planning to meet up with us on Ringaringa Beach later in the day.

Jenny and I head off at about 1pm after lunch. We walk into town, diverting along Butterfields Beach, which is mostly bare, but at the end I chance upon a nice *Gari convexa*. On through Oban along Halfmoon Beach, and jacket off I stroll on, bare-armed, in the sun. Along the road to Lonnekers Beach – where I try my cell phone, having been told by the postmaster that this is the only place on the island where they work – and bingo, it does! I seize the moment and have a lovely chat to my Mum and then to Graham at work – he does a good job of not minding the interruption and not being too envious about me being in the sun on Lonnekers.

At the end of Lonnekers Jenny diverts into the water and hunts around the rocks, and I have barely got my wet boots on when she shows me *Lenitrophon convexus*. This is a quiet, sheltered area near sand with some weed about – the best finds seemed to be among rocks piled on other rocks. Jenny also found live *Thoristella chathamensis* and very fresh *Neoguraleus murdochi* and an *Antisolarium egenum*. There were also some quite big *Buccinulum pertinax, B. vittatum* and a large clean *Turbo smaragdus*.

COW ISLAND (top left) and STEWART ISLAND MAINLAND

On we go over the hill to Ringaringa Beach. The tide is quite low and there are lovely rock pools to nose about in. Live *Haliotis australis* and *H. iris, B. pertinax* and *B. vittatum*, and largish *Turbo smaragdus* found. Also clean *Cellana ornata* at the high tide line on the big rock, and *Cellana stellifera* washed up. A large *Trichosirius inornata* with a hermit crab under a rock. Amongst blue mussels were one or two small *Lepsithais lacunosus. Paratrophon patens* were noticeably absent – definitely not as prolific as on past visits. *Lepsiella albomarginata* was not uncommon amongst the blue mussels. Doug meets us here and we find one good-sized paua for entrée tonight.

We trek on to Deep Bay in Paterson Inlet, where the tide has just turned and we are starting to get really cold. We find some *Xymene ambiguus* (not lots) and *Cominella nassoides* plus some blueish, striped *B. pertinax* – under rocks. Jenny noted two live *Alcithoe arabica* – one of good size and colour. Home to Doug's excellent dinner of paua and codfish.

Tuesday 23 April

Excellent dinners are becoming a trend. Tonight Jenny is cooking paua for entrée with yaki nori (seaweed – not yucky nori, either!) gathered and prepared by Doug. Then there is pork – but we could have had fish. Jenny caught a good-sized cod at the Horseshoe Bay breakwater today – without trying really, again using the Jenny Raven fishing method - when you see a good deep spot, you throw the line out, go shell collecting and come back when its time to leave and there is a fish on the end of the line!

Lest leisurely starts (due to late low tides) become a habit, Doug encouraged me to get up early today and go look – from a respectful distance this time – at his sea elephant. We saw its resting space and two sets of tracks into the sea – one in, one out, we figure – but we don't meet up today. Jenny is up when we get back, and after breakfast we walk into Oban. We have a look at the museum (with its shell collection) and the visitors centre. We return to our motel for lunch and then kit up in wetsuits for Horseshoe Bay. On the beach we find more nice *Gari convexa*. No *Hunkydora* though, despite our now knowing what they are (thanks to an email exchange with Club secretary Deirdre).

As we neared the far end it becomes a lot muddier, and I find a good *Astraea heliotropium* and two huge *Cyclomactra ovata*. There are also live *Alcithoe arabica*, some of them out walking, the animals extended and quite lovely to see. In all we see at least a dozen as we wade through knee deep water – not fine condition or large (though bigger than we've seen elsewhere here) but good that there is obviously a population here. We then climbed around the jetty and went to the far side of the breakwater. This time we have a tide far lower than when we were here last Thursday.

Doug and I paua-hunt with plenty of success, fishing lines are cast into the water, and in sheltered places Jenny found live *Lenitrophon convexus*, *Margarella turneri* and *Thoristella chathamensis* – all the things she had looked for without success last Thursday, along with plenty of *B. pertinax*, and more big *Turbo smaragdus*. Once again Jenny and I spend hours very wet in water up to wherever. At last, having pulled in Jenny's fish and fortified by a glug of Doug's irish coffee, we head back along Horseshoe Bay, wading through water and looking along the low tide line as the light fades. Nice *Soletellina siliquens* are seen through the water and some more *Gari convexum*, plus rolling in live, a good *Struthiolaria papulosa* (*gigas* form). We are wet and tired when we get home – plodding wearily up the hill to the sound of chortling kakas. The hot shower and dinner are well earned.

Wednesday 24 April

Wow what a day! Started quietly enough, with the possibility of going on the oyster boat this afternoon, so no other plans are laid at the start. Doug and I do an early walk, and after breakfast we ring Ken Geeson, our oyster boatman to see if oystering is on. "Ring back at about 3pm" he says, and we try to be patient and unconcerned.

In fact we have a date in Oban with David Valli this morning and we all walk in, with Doug going off to see family and Jenny and I discovering that David has just driven off with a tour party and won't be back until about 11.30am. We have a very civilised cappuchino and read the paper in the local internet café while we wait – and, boy, is it worth it ! When we meet up with David he takes us to his shed and invites us to help ourselves from a bin filled with *Astraea*

heliotropum which he had been saving for us since our last visit. There is also a large *Semicassis pyrum* and a *Charonia lampas*. These shells have all been trawled off South West Cape from the southern tip of Stewart Island.

We first met David and his wife Jayne on Stewart Island about six years ago, when they had not long taken over the Oban Tours business and were building it up. They were both keen beachcombers and gave us some shells, and we sent them a parcel in return. We had not heard back, but in fact David had these shells for us and just had not got around to sending them. When we got into his shuttle bus on the first day, he turned around and said "You're the shell girls, aren't you?" and we, rather astounded at his feat of memory, admitted that we were. The result of renewing the acquaintance is enough *Astraea* for both Jenny and me, and for Club members too – good things take time, as the saying goes – and just in time, since David and Jayne are about to put their business on the market with a view to travelling the world before returning to their Stewart Island home. We hope to see them again on a future visit.

THE OYSTER DREDGING TRIP

We make our way home to the motel and I do some packing preparatory to leaving in the morning. Time drags until just before 3pm when Jenny rings to find out if we are going out on the boat ... and we are! Be at the wharf at 4pm – and, of course, we are there, where Doug meets a work colleague from some years back, and we find that Ken and his helper Phil are happy to take Doug as well as Jenny and me. It just could not be a better afternoon for it – calm as glass as we motor out around Horseshoe and Mamaku Point towards Bob's Point where Ken drops the dredge for the first time. It seems unreal, but after just three dredge loads we have our quota of oysters for all of us, and a bucket of other shells that have come up at the same time. Live *Astraea* are

not uncommon, also a few live *Calliostoma punctulatum* and *Talochamys zelandiae* in sponge with *Mesopeplum convexum* and a few odd bivalves. Most are covered in weed growth, everything is a murky brown colour and not easy to spot amongst the oysters and other shell debris. Far from being a hindrance, we have been useful, helping to sort what has come up, and unbelievably we are back at the wharf by just before 6pm. The important thing to note is no way is it always as easy as this. Phil says "this is just as sweet as it gets". Well, it was wonderful for us - we have taken Sea Legs unnecessarily but who cares.

We treat ourselves to a fine dinner at the Church Hill Café, meet up with Bob and Bev Norman from Wellington and reminisce about the old MWD days, get taken and delivered back via the courtesy car and have eaten far too much (muttonbird, salmon and chicken). A grand sorting out of shells before bed so that Pat can pack her share ready for leaving tomorrow. Leave for home she must – but Jenny has more of a tale to tell of the next few days that remain before she and Doug must leave also.

Thursday 25th April
Pat has gone and Doug and Jenny move in with Doug's dad and relatives in a crib above Golden Bay in Paterson Inlet. The tides are now not good 5 – 6am/pm when it is dark and the weather changes for the worse. Only time for a walk along Horseshoe Bay today in between attending an ANZAC day lunch with the Doug's relatives and other Islanders. At least a *Modelia* is found on Horseshoe.

Friday 26th April
The weather is threatening. We take the dinghy out fishing - get a little wet and catch a few fish Thule, *Talochlamys zelandiae* are found attached to the underside of many of the rocks – good to see. Along further some nice pinkish coloured *Buccinulum pertinax* are under the rocks but again only where the rocks rest on sand. Back at the crib its rain, rain and more rain. Jenny treks Horseshoe one more time but the rain, wind and cold make it most unpleasant. Suddenly this isn't a likeable beach any more - no shells this time either. So its time to head for home and pack.

Monday 29th April
Jenny departs at 8am on the Foveaux Express. Oban and Doug on the wharf become a speck in the distance. Wellington and a new job beckon – this could be the end of the story …

but it isn't –

later we learn that Doug's dad had an interesting talk with our water taxi driver/oysterman, Ken. Turns out Ken, like Doug's dad is a retired secondary school teacher and Ken has an archaeology degree. Maybe that explains why he was prepared to assist these two ladies in wetsuits who asked to be dropped off at unusual places!

and further - … … anyone in Bluff at 9.30am on the Monday morning might have wondered at the sight of Jenny, struggling up the main street of Bluff with her bags and then knocking on the window of a certain establishment and entering through a side door - the reason? Following a friendly tip from Ken to contact the owner of the establishment who apparently collected shells - turned out neither the owner nor his wife collected shells but the large jar on the counter contained some excellent deep water shells from the far south of New Zealand. Some of these even came back to Wellington with Jenny - with the distinct possibility of more in the future!

All in all a wonderful trip!

SHELL LIFE AROUND OBAN

Comment on the Species List and shells Found

The following is a species list of shells found around the Oban area on Stewart Island. This an update of the one that Jenny Raven published in *Cookia,* Volume 8, 1997, following a visit there in March 1996. Additional species found this time or noted living, in comparison with dead shells last time, are highlighted in **bold.** It should be noted that the list is typical of inter-tidally found shells only, other than the few shells noted from the one dredging trip.

Additional New Species

This updated list is significant in that over 60 additional species were found this time. In most cases these species are not unusual for the area and were probably present in 1996 but just not noted at that time.

Additional species of significance were the keyhole limpet (*Monodilepas*), wentletrap (*Cirsotrema*), *Calliostoma foveauxanum* and very large pieces of *Offadesma angasi. Monodilepas* particularly, is not commonly seen and it was pleasing that, once one was found washed up that we correctly identified, more might be found along the high tide drift line on the Cow Island ocean beach in virtually the same situation as the northern species of *Monodilepas* can be found at Cape Maria van Diemen.

The only area of shell sand found around the Oban area was, as last time, in one spot at Cow Island. This again proved to be a little treasure trove of smaller shells found only in the south. Additional species of interest here were *Marinula striata, Kerguelenella* and *Comptella devia.*

Situation / Occurrence

Time was also spent time on this trip noting the type of situation that living species particularly, were found in and their frequency of occurrence in that location.

Some interesting observations were:-

- *Buccinulum pertinax* likes to rest on sand and once rocks were on rocks it was usually not found.
- *Lunella smaragda* liked mid tide sheltered sandy areas among rocks,
- *Alcithoe arabica* liked sheltered areas of silty mud just below low tide.
- *Xymene ambiguus* and *Cominella nassoides* liked feasting on cockles (*Austrovenus*) in muddy stream mouth areas and all surfaced in relative abundance once the tide started coming in.

In respect to occurrence it was noted that blue mussels were not as prolific at Ringaringa and Native Island as they had been previously and consequently shells that had last time been noted on, or amongst the mussels either were not present ie. *Calliostoma punctulatum* or were present in greatly diminished numbers, i.e. *Paratrophon patens.*

Some of the smaller shells that had previously inhabited sheltered areas were also not as common as previously. In this category were *Thoristella chathamensis, Margarella sp.* and *Lenitrophon convexus.*

Shells particular to the South

Because of the colder temperatures it is interesting to realise that virtually every shell on the list is an endemic New Zealand shell and that many shells found on Stewart Island are only found in southern parts of New Zealand, i.e. the southern limpet (*Cellana strigilis), Margarella sp.,. Zeacolpus symmetricus, Comptella curta* and *C. devia, Kerguelenella, Marinula striata, Buccinulum pertinax,* and *Cominella nassoides* .

On the other hand, some endemic New Zealand shells were found equally as commonly here as in the far north of New Zealand indicating the hardy nature and adaptive skills of these particular species, i.e. *Struthiolaria papulosa, Alcithoe arabica, Calliostoma punctulum, Cantharidus opalus, Astraea, Talochlamys zelandiae,*and *Trochus viridus.*

It is also notable that some shells apear to revel in the colder temperatures and either thrive here in abundance or grow to a far larger size than other parts of New Zealand, i.e. *Xymene ambiguus, Semicassis pyrum, Modelia granosa,* and *Struthiolaria papulosa.*

A further survey in future years should prove interesting.

Locations Visited

The locations visited around Oban were all slightly different. Only Ringaringa and one of the beaches on Native Island are similar. A summary of the locations and their situation is:-

- Paterson Inlet:- sheltered no washups, little wave action, all shells commonly living in situ.
- Lonnekers:- sheltered, much weed growth on the rocks, some wave action, sandy bottom.
- Horseshoe/ Maori Beaches:- long curved sandy beaches –slightly sheltered, rocks at each end with a wharf and rock breakwater at Horseshoe bay.
- Ringaringa :- sandy beach at the entrance to Paterson Inlet exposed to Foveaux Strait, some rocks, much beach erosion in recent years.
- Native Island:- Three beaches facing different directions. The beach we mainly collected from this time forms an extension of Ringaringa beach and separated by the entrance to Paterson Inlet. Sandhill Bay is much more exposed with kelp and a few rocks.
- Ackers Point:- same as Sandhill Bay -very exposed with kelp and strong wave action; not visited this trip.
- Cow Island:- exposed ocean beach facing the southern ocean; some shelter is provided by the Island; many rocks.
- Port William:- sheltered clean water; smooth rounded stones with little weed growth.
- Dredging Trip:- The trip on the oyster dredge was near Bob's Point, off Lee Bay in about 13m depth and about 100m from shore.

SPECIES LIST – MOLLUSCS AROUND OBAN, STEWART ISLAND

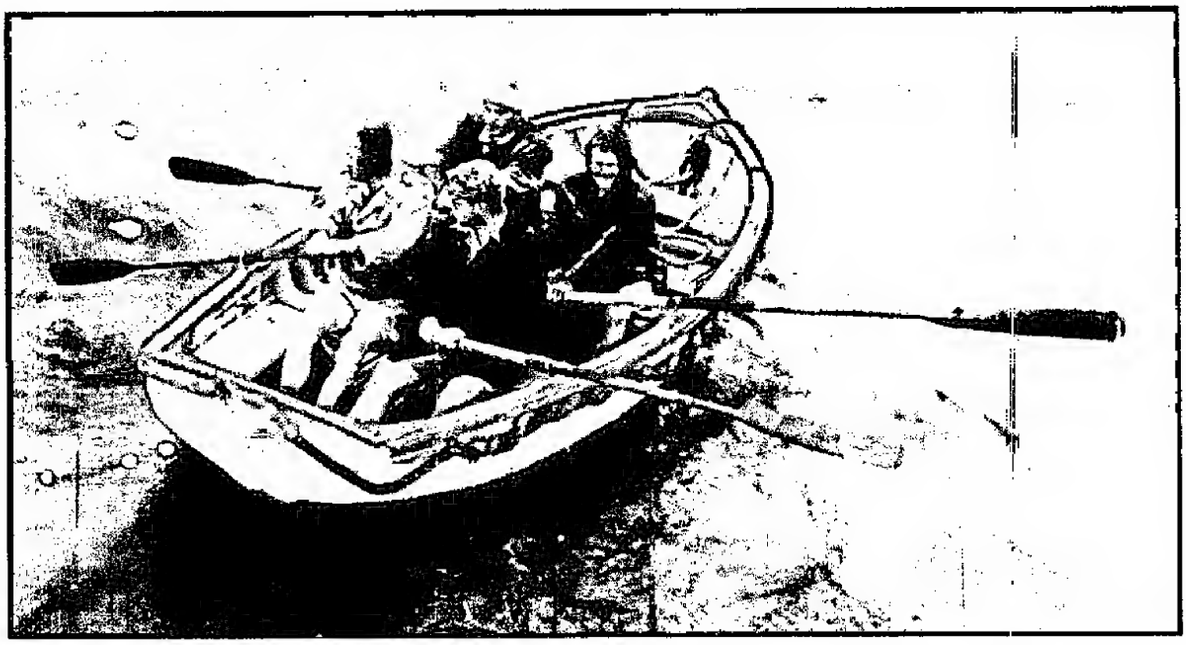
NAME	Paterson Inlet	Lonnekers / Halfmoon	Horseshoe/ Maori Bays	Ringaringa	Native Island	Ackers Point	Cow Island	Port William	Comment	Occurrence
GASTROPODA										
Cellana radians				L	**L**		**D**		*perana* form not uncommon	C
Cellana ornata			**L**	L					Clean specimens	C
Cellana strigilis redimiculum	**L**		L	**L**	**L**	L	L	**L**	Common limpet on open coast	C
Cellana stellifera			**D**	**D**	**D**					
Asteracmea suteri							**D**		In shell sand	
Atlacmea fragilis	L		L					**L**	Under smooth rocks with *Diloma bicaniculata*	U/C
Notoacmea elongata			L					**L**	Under smooth stones with *Atlacmea fragilis*	C
Notoamea pileopsis sturnus				**L**	L		L		On shaded parts of large rocks	U/C
Notoacmea parviconoidea			**L**	L			**L**		On backs of blue mussels	C
Notoamea scopulina							**D**		In shell sand	
Patelloida corticata					**L**		**D**			**C**
Radiacmea inconspicua			**D**		**D**		**D**			
Haliotis iris	**L**		✓L✓	**L**			L		Under large rocks at low tide	C
Haliotis australis		**L**	✓L✓	**L**	**L**		**D**		Under large rocks at low tide	**C**
Haliotis virginea			D				**D**			U/C
Emarginula striatula			**D**				**D**			
Scutus breviculus	**L**	**L**		**L**	**L**				Under large rocks	**C**
Tugali suteri							D		In shell sand	
Monodilepas monilifera							**D**		On high tide drift line	
Cantharidella tesselata				**L**						
Cantharidus opalus			✓D	**D**						
Diloma nigerrima						L		**L**	On midtide rocks on open coast	C
Diloma bicaniculata	L		L					**L**	Same locality as *Atlacmea fragilis*	C
Diloma subrostata	L								On midtide rocks, nice yellow/ black colouring	
Diloma zelandica							**L**	**L**		**C**
Margarella turneri			L				**D**		Under stones on sandy bottom with light weed	U/C
Margarella antipoda rosea				✓	**L**	L	L		Inside kelp holdfasts	U/C
Melegraphia aethiops		**L**	✓							**C**
Micrelenchus dilatatus				**D**			D		In shell sand	

			H	M							
Micrelenchus huttonii	L	L								Under stones on gravel bottom	C
Micrelenchus tenebrosus				L							**U/C**
Thoristella chathamensis	**D**	**L**	L					L		Under stones at low tide in sheltered areas	U/C
Trochus viridis	**L**		✓**L**								**C**
Antisolarium egenum		**D**									
Zethalia zelandica			**D**	**D**	**D**			D		In shell sand	
Calliostoma punctulatum			✓D✓	L						Sandy locations on low tide rocks	C
Calliostoma granti			D								U/C
Calliostoma pellucidum			**D**✓								
Calliostoma foveauxanum			**D**								**R**
Astraea heliotropium			✓D✓		**D**			**D**		Live on oyster beds	C
Modelia granosa		✓ half moon bay	✓D✓						**D**	Large clean condition some still with animal /operculum	U/C
Turbo smaragdus	**L**	**L**	L		**L**			L		Large size on sheltered low tide rocks	C
Argalista crassicostata								**D**		In shell sand	
Maoriculpus roseus	**L**	**D**		**D**							**U/C**
Zeacolpus symmetricus			✓D✓							On low tide drift line	C
Nodilittorina antipodum					**L**						
Risellopsis varia								D		In shell sand	
Merelina harrisonae								**D**		In shell sand	
Onoba foveauxiana								**D**		In shell sand	
Rissoina chathamensis								D		In shell sand	
Struthiolaria papulosa			✓**L**✓							Sandy bottom washed ashore	C
Crepidula monoxyla			L✓							Inside mouth of dead shells	
Sigapatella novaezelandiae	**L**		✓**D**		**D**			D		In shell sand	C
Trichosirius inornatus			**D**	**D**				D		Large size, in shell sand	
Tanea zelandica		**D**	✓D					D		Large size, on sandy bottom some still with animal/ operculum	
Uberella vitrea								D		In shell sand	
Argobuccinum tumidum			D		**D**			**D**			
Cabestana spengleri			**D**								
Cirsotrema zelebori	**D**										
Paratrophon patens				L	L					Amongst blue mussels, some pink	
Comptella curta								D		In shell sand	C
Comptella devia								**D**		**In shell sand**	
Lenitrophon convexus	L	L	L					**D**		Same locations as *Thoristella chathamensis*	C
Xymene ambiguus	L									Feeding on *Austrovenus* once tide turns	C
Xymene gouldi				**D**							
Xymene huttoni								**D**			
Lepsiella albomarginata				**L**✓						On low tide rocks	**C**

Lepsithais lacunosus	L		L	L	L				On low tide rocks	C
Buccinulum pertinax	L	L	L	L	L		L		Under rocks on sand	C
Buccinulum vittatum	L	L	L	L	L				Under rocks, orange near Thurle	C
Buccinulum pallidum	L								Under rocks	U/C
Cominella nassoides	L		D				D		Feeding on *Austrovenus* once tide turns	C
Paxula paxillus							D		In shell sand	C
Paxula transitans			L				D		Underside of rocks	
Zemitrella choava							D		In shell sand	
Zemitrella sulcata							D		In shell sand	
Alcithoe arabica	L		L	D			D		Partly buried or crawling on mud at low tide	C
Alcithoe fusus			D							
Austromitra rubinosa							D		In shell sand	
Neoguraleus lyallensis	L						D		In shell sand	
Neoguraleus murdochi		D	D	D			D		Under low tide rocks	C
Liracraea epentroma							D		In shell sand	
Turbonilla sp.							D		In shell sand	
Benhamina obliquata							L		On midtide shaded rocks	U/C
Kerguelenella sp.							D		In shell sand	
Siphonaria propria	L						D			C
Siphonaria australis	L	L	L		L		D			C
Marinula striata							D		In shell sand	
BIVALVIA										
Nucula sp.							D		In shell sand	
Barbatia novaezelandiae			D				D		In shell sand single valve	
Glycymeris modesta			D				D		In shell sand	
Mytilis galloprovincialis	L		D	L	L				Attached to lowtide rocks	C
Vertipronus mylitis							D		In shell sand	
Perna canaliculus			L		L				Attached to lowtide rocks	U/C
Aulacomya atra maoriana	L		D		L				Attached to lowtide rocks	C
Modiolus aeriolatus			D							C
Modiolarca impacta			D							C
Trichomusculus barbatus							D		In shell sand	
Ostrea chilensis	L								Common dredged	C
Mesopeplum convexum			D						Dredged 13m off Lee Bay	
Pecten novaezelandiae	L		D							C
Talochlamys zelandiae	L		D						Attached to underside of rocks	U/C
Talochlamys gemmulata	D		D						Dredged 13m off Lee Bay	
Pododesmus zelandicus	L								Attached to underside of rocks	U/C
Lasea hinemoa							D		In shell sand	
Borniola reniformis	D								In shell sand	C
Cyamiomactra problematica							D		In shell sand	
Cardita aoteana			D				D		In shell sand	
Purpurocardia purpurata			D		D					U/C

Pratulum pulchellum			**D**							
Cyclomactra ovata			**D**						Huge size	
Mactra murchisoni			**D**						Single valve	
Paphies australis			**D**		**D**					
Paphies subtriangulata			**D**							
Macomona liliana	**D**									**U/C**
Pseudarcopagia disculus	**D**						**D**			
Gari convexa			D						Large fine specimens	C
Gari stangeri			**D**		**D**					**C**
Soletellina siliquens	D		D							U/C
Dosina zelandica			**D**						Single valve dredged 26m off Lee Bay	
Austrovenus stutchburyi	**L**								Near stream mouths	**C**
Tawera spissa			**D**		**D**				Single valve only	
Irus reflexus			**D**							
Ruditapes largillerti	**D**		D		**D**				Large and heavy	C
Hiatella arctica							**D**		In shell sand	
Offadesma angasi			**D**						Large pieces	
Hunkydora australica novozelandica			D							U/C
Myadora striata			L						Large, some washed up live	C
CEPHALOPODA										
Argonauta nodosa			**D**						Piece of large specimen	

A VIGNETTE FROM THE CHATHAM ISLANDS 1954 EXPEDITION



The ill-fated "ferry boat" going in to Glory Bay, Pitt Island, to pick up 3 expedition members who had spent the night ashore – Jock Moreland and John Yaldwyn with Dick Dell and George Knox – *before* it tipped overt in the surf ! 26th January 1954. Photo: Dr E.J. Batham

4th Australian Shell Show, Brisbane, 23-24 March 2002

by Pat Lakeman

Ooh, sometimes travelling with a laptop computer can be great – here I am in Oz tapping away my story about the Australian Shell Show knowing it will be easy to edit and add to .... so I'll get it to Elliot promptly! I was spending the week with family on the Queensland Gold Coast, with my elderly Mum, and with marvellous good fortune had been able to arrange the trip to coincide with the weekend of the 4th Australian Shell Show in Brisbane. I travelled up on the train on the Friday afternoon. I had brought two exhibits, plus some New Zealand shells to trade/sell - but some of the latter were in very rough condition, so I spent much of Friday evening stuffing gastropods with cotton wool and oiling them, in the hope it would be worth it when the swap session happened on Sunday morning. Shells are only one interest however - I had first tried hard (with no luck) to find a Foxtel TV in order to watch the Hurricanes v. Cats Super 12 game!

I always wake early and don't need alarms or wake up calls. That is how I found myself arriving at the Show venue with barely 25 minutes to set up my exhibits! I only had two, so it wasn't really dire, but I did feel rather rude to shelling friends who were greeting me warmly despite my distractedly trying to get on with set up. Official set up time was 6am to 8am in the morning (the only uncivilised thing about the Show!) and I wasn't the only one who thought that the next thing to do was go back to bed! I didn't, but it was good to eat a leisurely breakfast while judging occured 8am to 10am.

I hadn't had a chance to look at what other people were doing during my hasty set up, but the standard at the Australian shows is always high, and when I went back to the official opening at 11am I was delighted to find I had won a second and a third prize. The second for my treasured *Haliotis* was particularly gratifying, as it was in the Open Family category which is always tough to win. The winning entry featuring *Marginella* by Barb Collins was really excellent.

The Show was in a large upstairs room at the Greek Club and Convention Centre in South Brisbane. I think there were around 90 exhibits in 33 classes lining the outer walls, with two big blocks of dealers' tables in the centre. On the Saturday morning the room was a real hubbub of people and activity - crowds around the dealers tables in particular – and it wasn't easy to get a bit of quiet for the short opening welcome. Afterwards, I contributed my share to the income of various dealers – looking for the *Haliotis* and Cassids I would never expect to see at home. At the same time, greeting the many friends with whom shelling has brought me into contact. Grinning as I listened to Doug Thorn's impressive sales pitch, I had to tell him it was well worth coming to the Oz shows just to hear him talk about his amazingly reasonable prices for the biggest and the best shells in the world! Most gratifying was to meet an Auckland contingent – Heather Smith, Rae Snedden, Gladys Goulstone and Betty Headford – whom I didn't know were going to attend. had thought I might be the only Kiwi except for the Harts who I knew would have a dealer's table – very nice when to have a bigger group there!

I had arranged to meet a friend who lives in north Brisbane for lunch, so that took me out of the Show around midday and probably saved me a small fortune. It turned out, with the Show closing for the day at 4pm, that I didn't get back in time, so it was odd to go to the prizegiving dinner that night not having seen many of the exhibits! The dinner was also at the Greek Club in the room where shell-related talks were going on during the days, and for an excellent meal and an enjoyable chat the NZ contingent were joined by ex-Kiwis Joy and Malcolm Ford (now of Gladstone). Notably a large number of trophies were won by the South Australians, so it was only

fair that they should announce the 5th Australian Shell Show will be in Adelaide in 2004. I'll do my very best to be there!

Sunday morning was due to start at 10am but many enthusiastic shellers were there by soon after 9am. I hadn't looked at many exhibits on the previous day, so I was keen to see which displays had taken the big prizes. The amateur trading at 10.30 am was keenly attended, and it was much fun and swapping through to midday. Videos and talks continued throughout Saturday and Sunday afternoons – one full of superb photography was about killer cones and how they do it!

My brother James arrived mid-afternoon with his video camera, so I had some fun filming my feet as well as a bit of the Show. (Luckily Jim got some good footage!). With more chatting to friends old and new – and, of course, a few last minute purchases - it was soon time to take our exhibits down, and make our farewells. Until next time! - which, our diaries are already marked, is 19-21 March 2004, in Adelaide at the Morphettville Race Course .... Many thanks to Sally, Robert, Callum, Cheryll and our other Brisbane hosts for a great Show ... see you in Adelaide!

HOME THOUGHTS FROM WAIKANAE BEACH

By N.E. Body

Once upon a time there was a man at Waikanae who used to go to the seashore to do his writing. He had a habit of walking along the beach before he began his work.

One day he was walking along the shore. As he looked down the beach he saw a human figure moving like a dancer. He smiled to himself thinking of someone who would dance to the day. So he began to walk fast to catch up.

As he got closer he saw that it was a young man, and the young man wasn't dancing, but instead was reaching down to the sand, picking up something and very gently throwing it into the ocean.

As he got nearer to the young man he called out, 'Good morning. What are you doing?"

The young man paused, and replied, "Throwing shellfish into the ocean."

"I guess I should have asked you why you are throwing shellfish into the ocean.

"The sun is up and the tide is going out. If I don't throw them back they'll die."

"But, young man, don't you realise that there are miles of beach with shellfish all along it. You can't possibly make a difference."

The young man listened politely, then bent down, picked up another shellfish and threw it into the sea over the breaking waves and said, "It made a difference for that one."

THE KILBIRNIE SHELL BED – A NEVER-ENDING STORY

By John Marston

I've borrowed the first part of my title from Elliot Dawson's background summary[1] about the mythical and geological history of the Kilbirnie isthmus1 which was prompted by Jenny Raven's observations on an aspect of Wellington's past revealed by shell deposits in this locality.[2] The second part of the title denotes that this is a continuing, in fact 'nerve-ending', story as new information comes to light, as it inevitably does when following up such topics as this.

I, too, had discovered the excavations going on at Kilbirnie on the site of the new supermarket, situated between Mahora, Rongotai, and Onepu Roads, and I had begun crawling in and collecting there when the workmen had left for the day. Then I was called south for the next two years, so nothing further was done by me – although the work of excavation and building continued till completion of yet another new "Pak'n Save" – hence I was interested to read what was said in these two articles.

In my own investigation I had descended about 10 metres into the huge pit that the excavators had made at that stage, but I couldn't dig footholds on the near vertical face of the cut to study the strata had been been exposed because it was merely firm sand and not too consolidated for safety. A list of the species that I did manage to collect can now serve to supplement the two earlier accounts.

STRATHMORE RIDGE

Jenny Raven named a few species which had eroded out from banks here, which were presumably part of a Maori midden:

Austrovenus stutchburyi
Dosinia anus
Paphies subtriangulata
Austrofusus sp.

Interestingly, only *Austrovenus* occurred in the Kilbirnie isthmus excavation site – and very abundantly too. The other three species are all dwellers of the open sea coast rather than of sheltered harbours and inlets, so they were represented in the excavation pits and surface spoil by *Dosinia subrosea* and *Paphies australe*. No specimens of *Austrofusus* were found.

KILBIRNIE/EVANS BAY CORE SAMPLES

Elliot Dawson's article refers to studies[3],[4] made of seismic profiles and core samples from boreholes done in 1978 and 1979 down to about 40 metres in the southern part of Evans Bay which showed that a drowned river valley, eroded probably along the shatter zone of a late Pliocene fault on the eastern side of the bay, had become partly filled with sediments during two glacial/interglacial cycles. These sediments contained two assemblages, interglacial shelly marine sands and muds which, from pollen analyses, indicated a neighbouring landscape of rimu-podocarp forests, and glacial age gravelly and carbonaceous deposits considered to have been laid down in various estuarine and terrestrial situations. Cooling of the climate led to a change to beech and manuka in milder climates, and in the glacial phases Evans Bay was, apparently, "a bleak, windswept, grassy and swampy valley."[4] A sequence of at least five formations and pollen

zones, ranging in time from the beginning of the penultimate glacial age, over 130,000 years before the present to the Holocene following the last glacial age some 10,000 years back, revealed evidence of a complex series of events and habitat changes over a long period of time. In one formation, "D" (laid down during the warm last interglacial phase between 75,000 and up to 130,000 years, with a surrounding landscape of trees and shrubs), a layer of shelly sands, ranging in thickness from 3 metres to 15 metres, there were found a few silt horizons and some conspicuous shell layers, considered by Dr Philip Maxwell as indicative of "a calm-water, shallow, nearshore marine fauna" in which were "*Maoricolpus roseus*, *Venerupis* cf. *largillierti*, *Xymene*, *Dosinia*, ?*Mactra* (?*Cyclomactra*), and *Soletellina*, with the addition of some brackish-water species, *Austrovenus* cf. *stutchburyi* and *Melanopsis trifasciata*." In the supermarket excavation site, which is some distance south nearer the centre of Kilbirnie from where the bores were made in Evans Bay, I found these species also, except for *Cyclomactra* and *Melanopsis*. *Cyclomactra ovata* usually favours sheltered waters in bayheads or harbour shallows, and *C. tristis* occurs in extremely brackish-waters in estuaries and quiet river mouths. *Melanopsis* lives in such brackish-water that it is almost a freshwater snail. I have seen photographs taken in 1904 which show that sea still came right in to just across the road in front of St Giles' Church at Kilbirnie. All that area was reclaimed to form what is now the Kilbirnie recreation grounds. *Melanopsis* would have lived there where streams drained into the embayment from the Hataitai hills. A swampy estuarine area into which the main Haitaitai stream flowed is shown a map of southern Evans Bay (given in one of the stratigraphic reports on the boreholes[4]) on which a reclamation date of 1900 is indicated, which adjoins a "sandy sublittoral platform" reclaimed from 1960 onwards. The beach marked on the southern side of this platform is very close indeed to the supermarket excavation.

SHELL LAYERS AT THE KILBIRNIE SUPERMARKET SITE

I was only able to see the strata of shells and sands exposed in the excavations, and not actually collect from them, and it was not easy to distinguish the details of the various layers at a distance. The accompanying photographs that Elliot Dawson took on 29th October 1998, however, serve to show something of the depth of the excavations then and the difficulty of getting ready access. Had it been otherwise, a detailed stratum by stratum examination of the sediments themselves and the particular molluscan species, and their relative numbers, within each stratum could have given some exciting new evidence of all the earthquake uplifts and sea transgressions that have taken place during at least the first two sequences[4] "A" and "B", over the past 10,000 years. The contractors worked very fast, so there was no leisurely opportunity to retrieve such evidence. Correlations of earth movements with events elsewhere in the Wellington region, notably the formation of the raised beaches at Turakirae, would have been interesting. Each level exposed so briefly at Kilbirnie during the supermarket excavations would represent the living sea shells entombed at each time of sealevel change, and the change in water depth itself and in the nature of the shoreline would be reflected over time in the identity of the species living in these new ecological situations.

My observations were that the topmost layer of shells which had been dug into contained the least interesting species, those which would have lived in the shallowest waters. They include: *Notoacmea helmsi*, *Cominella adspersa*, *C. glandiformis*, *C. maculosa*, *Zeacumantus subcarinatus*, *Melagraphia aethiops*, *Turbo smaragda*, *Diloma subrostrata*, *Xymene plebeius*, *Austrovenus stutchburyi*, and *Paphies australis*. Perhaps in the last of the major uplifts prior to 1855 a central sandbank accumulated, blocking the previously open channel between what are now Evans Bay and Lyall Bay and maintained by strong gales and tides bringing in sediment which would eventually form a tombolo culminating in the uplifting in the 1855 earthquake which uplifted the new isthmus of Kilbirnie (or Rongotai) by 1.8 metres. All these changes

would, of course, be documented in those tantalising layers so briefly revealed in the supermarket excavations.

Although I was unable to climb the 10 metre face of damp sand to prove it, I have to assume that the following species could well have represented the molluscan communities which were living in this area before the isthmus was properly formed:

Notoplax mariae, Notoacmea elongata, Trochus tiaratus, Maoricolpus roseus, Rissoina chathamensis, Buccinulum linea, Xymene pusillus, Pecten novaezelandiae, Dosinia subrosea, Ruditapes largillierti, Dosina zelandica, Corbula zelandica, Tawera spissa, Atrina pectinata zelandica, Gari stangeri.

These species could have lived from low tide mark down to 10 metres or more, with all or some of the time in open-sea waters of Lyall Bay.

The next stratum would have included dwellers of even deeper water or with greater preference of the open sea, but still be representative of the latest sequence, "A", demonstated in the boreholes[4]. They would probably include those just listed but in addition – *Zenatia acinaces* and *Bassina yatei*, which we tend to associate with open ocean beaches. *Panopea zealandica* would perhaps come into this category, also the following:

Cantharidus purpureus, Micrelenchus rufozonus, Thoristella chathamensis cookianus, Zeacolpus delli, Amalda (Baryspira) australis, Phenatoma rosea, Agatha georgiana, Siphonaria propria, Leptomya retiaria, Divaricella huttoniana, Tellinota edgari, Mellipteryx parva, Macomona liliana.

The large *Perna canaliculus* and *Chlamys zealandiae* raise a problem since no anchor stones were visible, but perhaps colonies of *Atrina pectinata zealandica* offer the clue, as they do not burrow deeply but are often content to have half their shells above the surface. Minute shells shelter in their hollow spines, and various marine growth attach themselves too. *Chlamys zealandiae* frequently shelters in "mermaids' fingers" sponges, and *Perna* could attach its byssus to an *Atrina* shell or the encrusting growths on it. *Ostrea lutaria* (the *charlottae* form) is usually free-living or in clumps on the mud. There were no species such as *Dosinia greyi, Panopea smithae*, or *Neilo australis* present, hence my suggestion of a no greater depth for even this third group, and 10 metres is only anbitrary suggestion.

Presumably we would have been able to find further layers of shells still further down, even below the excavated levels. Such layers could contain species even more characteristic of open-sea shore environment such as *Mactra discors, M. murchisoni, Spisula aequilatera*, or *Dosinia anus*, if they were representing a time when Miramar Peninsula was the island cut off from the rest of Wellington. The shores of the channel itself might have been home to small gastropods on solid substrates not yet discovered by borehole sampling.

Readers may wonder how I collected a half-millimetre *Liotella polypleura* and 3 totally transparent *Scintillona zealandica*, only two millimetres in size, from amongst such debris excavated and bulldozed on this site. The answer is that they were in the sand inside bigger shells, as were specimens of *Pisinna r. reokohuana, Eatoniella olivacea*, and *Chemnitzia*. The largest shells fared worst from the excavators. The absence of *Alcithoe* and any *Penion* is most surprising as they ought to have been represented.

This is a brief account of my findings from this site, not only supplementing the two earlier articles in *Cookia*, but, hopefully, showing that there are yet more secrets lying beneath the Kilbirnie isthmus. If only we could get prior notice of such exciting excavations and get there, and be officially welcomed and given time to search more leisurely!

SPECIES COLLECTED FROM THE KILBIRNIE EXCAVATION - MAHORA/KILBIRNIE/ONEPU ROADS

POLYPLACOPHORA

Notoplax mariae (Webster, 1908) [3 valves]

GASTROPODA

Notacmea elongata (Quoy & Gaimard, 1834)	*Eatoniella olivacea* (Hutton, 1882)
Notoacmea helmsi (Smith, 1894)	*Rissoina chathamensis* (Hutton, 1873)
Cantharidus purpureus (Gmelin, 1791)	*Nozeba emarginata* (Hutton, 1885)
Diloma subrostrata (Gray, 1835)	*Zegalerus tenuis* (Gray, 1867)
Melagraphia aethiops (Gmelin, 1791)	*Xymene plebius* (Hutton, 1873)
Micrelenchus huttoni E.A.Smith, 1876	*Xymene pusillus* (Suter, 1907)
Micrelenchus rufozonus (A. Adams, 1853)	*Buccinulum linea* (Martyn, 1784)
Thoristella chathamensis cookiana Powell, 1934	*Cominella adspersa* (Bruguière, 1789)
Trochus tiaratus Quoy & Gaimard, 1834	*Cominella glandifomis* (Reeve, 1847)
Liotella polypleura (Hedley, 1904)	*Cominella maculosa* (Martyn, 1784)
Antisolarium egenum (Gould, 1849)	*Amalda (Barypira) australis* (Sowerby, 1830)
Turbo (Lunella) smaragdus Gmelin, 1791	*Austromitra rubiginosa* (Hutton, 1873)
Zeacumantus subcarinatus (Sowerby, 1855)	*Phenatoma rosea* (Quoy & Gaimard, 1833)
Maoricolpus r. roseus (Quoy & Gaimard, 1834)	*Agatha georgiana* (Hutton, 1885)
Zeacolpus delli Marwick, 1957	*Chemnitzia zelandica* Hutton. 1973
Pisinna rekohuana rekohuana Powell, 1933	*Siphonaria propria* Jenkins, 1983

BIVALVIA

Nucula sp.	*Tellinota edgari* (Iredale, 1915)
Perna canalicula (Gmelin, 1791)	*Gari stangeri* (Gray, 1843)
Atrina pectinata zelandica (Gray, 1835)	*Leptomya retiaria* (Hutton, 1885)
Ostrea lutaria Hutton, 1873 [*charlottae* form]	*Dosina zelandica* Gray, 1835
Pecten novaezelandiae Reeve, 1853	*Austrovenus stutchburyi* (Wood, 1828)
Chlamys zelandiae Gray, 1843	*Bassina yatei* (Gray, 1835)
Divalucina cumingi Adams & Angas,1864	*Tawera spissa* (Deshayes, 1835)
Mellipteryx parva Deshayes, 1856	*Dosinia subrosea* (Gray, 1835)
Scintillona zelandica (Odhner, 1924)	*Ruditapes largillierti* (Philippi, 1849)
Zenatia acinaces Quoy & Gaimard, 1835	*Corbula zelandica* Quoy & Gaimard, 1835
Paphies australis (Gmelin, 1791)	*Panopea zelandica* Quoy & Gaimard, 1835
Macomona liliana (Iredale, 1915)	*Myadora striata* (Quoy & Gaimard, 1835)

NOTES

1 Dawson, E. 1998: The Kilbirnie shell bed: a slice into history. *Cookia* 9: 33-38

2 Raven, J. 1998: Wellington Harbour's past revealed. *Cookia* 9: 32.

3 Lewis, K.B.; Carter, L. 1976: Depths, sediments and faulting on each side of the Rongotai isthmus, Wellington. *New Zealand Oceanographic Institute Summary* 11: 1-31.

4 Lewis, K.B.; Mildenhall, D.C.; Clowes, C.D. 1985: The late Quaternary seismic, sedimentary and palynological stratigraphy beneath Evans Bay, Wellington Harbour. *New Zealand Journal of Geology and Geophysics* 28: 129-152.

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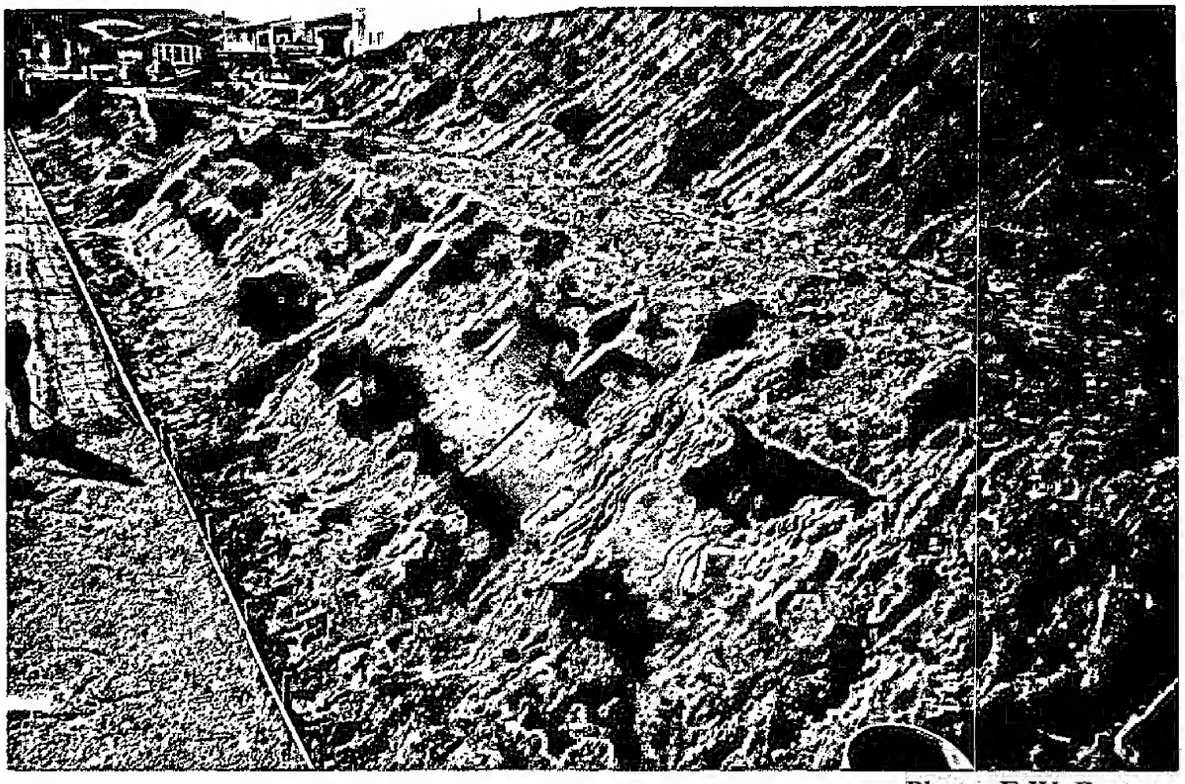

Photo: E.W. Dawson

KILBIRNIE SHELL BEDS AT "PAK'N SAVE" SITE
from Onepu Road across to Mahora Street
29 October 1998

AGM 2001

Per usual, Judy had organised the Hardwick Smith Lounge for our AGM/end of year 'do,' BUT she forgot to order good weather. To call it bad weather was a massive understatement as it bucketed down all day, resulting in flooding and slips everywhere.

We had arranged for Digby to pick Jim up from the airport around 10.00am and the pair of them had toyed with the idea of a possible trip out to Green Point. So much for the best laid plans!! Digby, in his usual speedy manner, had hurried off to the airport, worrying that he might be late. This was a shame, as I, the logical member of the household had been thinking about calling in to see if planes were actually arriving in our fair city. Still, I did wonder just what I would find out as one never actually gets to 'talk' to anyone on these helpful?? systems of today, so filed the thought. Around 10.30 I received a frantic call "Have you heard from Jim as he's not here?"
"Has the plane landed and he's not on board, or what?"
"It's a real shambles here, but there's another plane due in soon from Nelson, so I'll check that and if he's not on that, I'll call you back."

About an hour later, with no luck on my part in phoning Jim on his cell phone, a call came from Digby, from a friend's house in a suburb near the airport, telling me he'd stay put for awhile, then would check out the next flight around 12.45. Time for action on my part had me phone Origin Pacific to try and trace our mate Jim. Much to my surprise a person answered the call, and an extremely helpful one at that. She thought the flight, which had been delayed, had now actually landed, or was about to, and had me wait while she went and checked. The outcome was that Jim, an enthusiastic shell collector, had been taken to Napier (maybe to take a quick look on the beaches there?) as the plane, having had a couple of goes at landing, had now headed north. My contact took our phone number, saying she'd let us know when, and if, the flight was going to try to land in Wellington again, which she duly did. The outcome was that Digby collected Jim, who was given a message as he stepped off the plane that he would be met – very efficient Origin Pacific – well done!

Time for a cup of tea, then off to the meeting via a back route, had us manage to get there on time, with those who came from the north. In dribs and drabs other members arrived, all with tales of queues, slips and what have you, but not all were so lucky. Kris considered herself very lucky however, as sitting in a car that had decided it was far too wet to move, was spotted by Doreen, and rescued, even if the car wasn't! During the evening, we had a phone call from Maryan, who reported that she and her husband, who had queued for two hours, arrived at a spot where they could turn round, so headed back home. Trix phoned with a similar tale, and it turned out that John Little had done the same, enjoying the plate of food 'to be shared' all by himself. Those of us who did manage to get to the AGM had the usual enjoyable evening, with good food, loads of shells to buy, fabulous raffles and most of all great company. All the same, let's hope that Judy has time to arrange the weather as well as the venue for this year!

Deirdre Standish

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"ARGONUT"

By Kris Woods

During Easter 2002 Jenny Raven, Trix Hennessy, Roger and I visited Mahia Peninsula. Roger and I drove up on Saturday and met up with Jenny and Trix at Cath and Bill Shortt's Mahia Beach holiday home early on Saturday evening for a barbeque. Bill is a new member of the Wellington Shell Club and has a passion for *Argonauta.* I mean a passionate passion. His utility truck's number plate says it all – ARGO.

Over the last three years Bill has collected 250 *Argonauta*. The *Argonauta. nodosa* have been collected from around the Mahia Peninsula, and the *A.argo* from northern Hawkes Bay beaches.

You can imagine our reaction as we walked into Cath and Bill's lounge and in front of us, displayed in beautiful, especially designed (and locked) glass-fronted cabinets, were an astonishing 29 *A.argo* and 28 *A.nodosa.* All were in the most pristine condition. The remainder of Bill's collection is split between his office and his home in Wairoa. The largest of Bill's collection of A.*argo* is a whopping 252mm x 152mm. Bill lovingly removed this stunning specimen from its display case and we were all quite speechless. It really was in perfect condition. Bill also has in Wairoa a tiny and whole *A.nodosa* only 25mm long.

Bill has a wealth of knowledge about *Argonauta* in general and enlightened us a good deal. He has expanded his *Argonauta* collection with numerous foreign specimens including *A. gruneri* (east coast of Tahiti) and *A. cornutus* (Gulf of California).

One particularly interesting episode, which Bill regaled, was on 31 December 1999 when he chartered a light plane to Portland Island off the southern tip of Mahia Peninsula. That one visit yielded 36 perfect *A.nodosa,* a staggering amount. According to A.W.B. Powell's *New Zealand Mollusca*, Portland Island is named as a known location for *Argonauta.* However, and most interestingly, A.*argo* is the species referred to and *A.nodosa* is not given a mention.

Bill's breathtaking collection inspired us and the following morning we were all out bright and early, hunting for *Argonauta.* Sadly they eluded us but look out William of Wairoa, we will be back.

This was yet another field trip to Mahia, which has been indelibly etched in my memory, as I am sure it has been for Jenny, Trix and Roger.

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SOME NEW FINDS – FLORIDA & THE BAHAMAS

By Zvi Orlin

I have recently returned from a visit to Florida and the Bahamas, and can tell of some interesting new species that I have found there.

I mainly collect from the beaches, in order not to disturb the habitats. My first one was a giant *Strombus gigas*, called Queen Conch, weighing almost 2 kg. In the course of my wanderings on Harbour Island, North Eleuthera, in the Bahamas, I was amazed to find two huge specimens of *Strombus gigas* discarded near a fishing harbour. As they were so heavy, I took only one – 26o mm tall – with a large outer lip broadly flared and mouth pink inside and on the columellar callus, whitish and brown marginally – most impressive in shape and colour! It had a hole in one of the upper whorls, as the fisherman had extracted the living parts – the meat is served as a special very popular dish. This did not disturb me, as my collection is for reference purposes to assist me in my classifications. I also found two smaller Strombidae – *Strombus pugilis* and *S. raninus*, both among the beautiful exotic species of the region, so I really was very lucky. Each one is a real treasure to me.

Secondly, for the first time in my decade of collecting, I found a few specimens of *Ficus papyratia* on the beaches of West Florida and the Keys. Some of them were slightly damaged as is to be expected from beach specimens, as these are very thin and delicate shells, easily broken by the motion of the waves, but I was fortunate enough to find some entirely intact specimens, which I could hardly believe. I was, accordingly, really thrilled!

Thirdly, I managed to collect a few specimens of *Busycon contrarium*, at three different locations in West Florida. It is called Lightning Whelk because of the brown wavy streaks running down the length of the shell. But, of course, the special feature of this shell is that it is spirally sinistral. This is the largest sinistral shell In have ever found, measuring 90 mm in length, of which I am very proud. But not less so, of another small, dextral specimen I found on the famous Sanibel Island, in the shallows during an early morning wade, which turned out to be another species – *Busycon spiratum*, the Pear Whelk – identified by a narrow channel at the suture.

These were some of the joys of this trip – and I may be able to add some more information to interest New Zealand readers.

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SOME RECENT PUBLICATIONS

BEU, A.G.; MARSHALL, B.A.; PONDER, W.F. 2002: Richard Kenneth ("Dick") Dell, 1920-2002: obituary, bibliography and a list of his taxa. *Molluscan Research* 22 (4): in press.

ENDERBY, J.; ENDERBY, T. 2002: Owhiro Bay Wellington. *Dive New Zealand/Pacific* No. 69: 35-36, 5 figs [an illustrated account of marine life found by scuba diving, and support for a South Coast marine reserve by the authors of *Goat Island, Leigh, New Zealand – an identification guide to the underwater inhabitants* (1998) – which shows the beneficial outcomes of such reservations.]

MARSHALL, B.A. 1999: A revision of the Recent Solariellinae (Mollusca: Gastropoda: Trochoidea) of the New Zealand region. *The Nautilus* 113 (1): 4-42, figs 1-138; 29 March 1999.

MARSHALL, B.A. 2000: Systematics of the genus *Infundibulum* Montfort, 1810 (Gastropoda: Trochidae). *The Nautilus* 114 (4): 149-154, figs 1-10; 15 December 2000.

MARSHALL, B.A. 2001: A replacement name for a New Caledonian *Calliostoma* species (Gastropoda: Trochidae). *The Nautilus* 115 (1): 36; 31 March 2001.

MARSHALL, B.A. 2001: The genus *Acesta* H.& A. Adams, 1858 in the southwest Pacific (Mollusca: Bivalvia: Limidae). Pp 97-109 in: Bouchet, P. & Marshall, B.A. (eds) Tropical deep-sea Benthos 22. *Mémoires du Muséum National d'Histoire Naturelle* 185.

MARSHALL, B.A. 2001: *Polinices* update. *Australasian Shell News* 12: 7.

MARSHALL, B.A. 2002: Authorship and date of publication of *Ostrea chilensis* Philippi in Küster, 1843 (Bivalvia: Ostreidae). *The Nautilus* 116 (2): 66-67; 18 June 2002.

MARSHALL, B.A. 2002: Some Recent scissurellids from the New Zealand region and remarks on some scissurellid genus group names (Mollusca: Gastropoda: Vetigastropoda). *Molluscan Research* 22 (3): 165-181, figs 1-26.

MARSHALL, B.A. 2002: Some Recent Thraciidae, Periplomatidae, Myochamidae, Cuspidariidae and Spheniopsidae (Anomalodesmata) from the New Zealand region, and referral of *Thracia reinga* Crozier, 1966 and *Scintillona benthicola* Dell, 1956 to *Tellimya* Brown, 1927 (Montacutidae) (Mollusca: Bivalvia). *Molluscan Research* 22 (4): in press.

MARSHALL, B.A.; BARTLE, J.A. 2002: Richard K. (Dick) Dell 1920-2002. *Te Ara – Journal of Museums Aotearoa* 27 (1): 37, 1 fig.

MARSHALL, B.A.; BURCH, K.W. 2000: The New Zealand Recent species of *Muricopsis* Bucquoy, Dautzenberg & Dollfus, 1882 (Gastropoda: Muricidae). *The Nautilus* 114 (1): 19-29, figs 1-38; 27 March 2000.

NGA MANU TRUST, 2002: Profile: Ian Townsend. *Friends of Nga Manu Trust Nature Reserve, Newsletter* 2 (2), March 2002: 1, 1 fig. [Biography of Ian Townsend, newly appointed trustee to Nga Manu Trust, noted, amongst other items of interest, as a member of the Wellington Shell Club.]

Ó'FOIGHIL, D.; MARSHALL, B.A.; HILBISH, T.J.; PINO, M.A. 1999: Trans-Pacific range extension by rafting is inferred for the flat oyster *Ostrea chilensis*. *Biological Bulletin* 196: 122-126

SPENCER, H.G.; WILLAN, R.C.; MARSHALL, B.A.; MURRAY, T.J. 2002: Checklist of the Recent Mollusca described from the New Zealand Exclusive Economic Zone. Electronic document available at: http://toroa.ac.nz/pubs/spencer/Molluscs/index.html/

STRINGER, I.A.N.; MONTEFIORE, R. 2000: Distribution and biology of the endangered kauri snail *Paryphanta busbyi watti*. *Science for Conservation* (DOC Science Publishing) 163. 42 p.

STRINGER, I.A.N.; McLEAN, M.J.; ARNOLD, G .C.; BASSETT, S.M.; MONTEFIORE, R. 2002: Growth and development of the rare land snail *Paryphanta busbyi watti* (Eupulmonata: Rhytitdidae). *Molluscan Research* 22 (4): in press.

BOOK REVIEW: *BAHAMIAN SEASHELLS. A Thousand Species from Abaco, Bahamas.* Published by Bahamianseashells.com, Boca Raton, Florida. US$ 190. 9.5" x 11" format, soft cover.

By Colin Redfern, 2001, xi , 280p. 124 plates (18 in colour).

The author spent 18 years living on Abaco, and afterwards returned annually, so his book sums up 37 years of collecting shells on this group of Islands, and is based on over 100,000 specimens. Collecting was from beaches, including beach drift, shallows by wading and snorkelling, dredging and Scuba diving to a depth of 15m and some sediment sampling from deeper waters. The study included the Islands of Great Abaco, Little Abaco, together with the off-lying Abaco Cays. Of special importance is that many microshells are included among the species reviewed.

The first section of the book is devoted to descriptions of all the species, with scientific name, author and common name, each one covered by an illustration in the second section of the book. The descriptions are very detailed, and are concluded by mentioning in what habitat they were found, which is also helpful. The species are numbered according to systematic order. I found them very satisfactory in helping to make positive identifications of specimens, that I had found in the adjacent Islands of New Providence and Eleuthera.

Owing to the fact that no suitable publisher could be found for the book, Colin had to arrange publication himself. Hence the illustrations were photographed mainly in black and white (over 100 plates), with 18 colour plates, as well as 75 scanning electon micrographs, comprising more than 2700 previously unpublished photographs, with often more than one specimen, from 2 different angles. Some also have enlarged details of the protoconch. Opposite each plate of photographs, is a descriptive column of the species, giving size and habitat and designating if there is also a coloured illustration with its number (for quick reference), and finally the text page of description. Mention is made if each specimen was taken alive, or from sediment, beach drift etc.

The colored plates, many of these photographs taken of living specimens in the water, which include many Opisthobranchia. An extensive bibliography is listed and a glossary of terms, used in the text. Overall, printing is clear and layout for easy reference.

Many of the species recorded are also found throughout the Caribbean, in Bermuda, South Florida, and along the coast in the Gulf of Mexico, and as far south as Brazil.
I should mention that before my shell collecting trip to Florida and the Bahamas, I was searching for updated books on the region, and found that most malacologists were using old books, published a few decades ago, with many names no longer valid. I must congratulate Colin on his important contribution to the literature on the Caribbean Islands, despite the enormous difficulties of publication, and I strongly recommend his publication to all conchologists. It was a lifetime work, for which he must be highly esteemed by all who seek to increase the scientific knowledge of the molluscs of the region. I have no doubt that more information will be forthcoming, and some corrections may be suggested, but it is a monumental work, which will be most helpful to all of us interested in this region.

Zvi Orlin
Email: zviorlin@actcom.co.il

TUSK SHELLS

In my forays along along the beach
They peeped from the sand almost out of reach;
One of the Mollusca not known by many,
Once used instead of the penny
And also for display and ornamentation
Now ignominously discarded by our congregation.

Their habitat is in the depths of the sea
Where few can penetrate their antics to see:
They stand erect, broad end in the sand
Like elephants tusks but not living on land,
Without gills, through their mantle they breathe,
Drawing in water from the thin apex, we believe,
And through this pipe on the upper end
Waste products into the sea they send;
Their thick foot burrows around
And by flailing sticky arms their food is found,
Carnivores on Foraminifera, their main prey,
And organic wastes floating astray.

This unique and quaint creature today
How did it evolve, who can say?
From its development it probably seems
A prehistoric offshoot of the Bivalve streams.

The Desert Gazelle [AKA, Zvi Orlin].

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which is regularly updated at http://toroa.ac.nz/pubs/spencer/Molluscs/index.html/
Authors should also save the editor work by checking the spelling of these names carefully.
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WELLINGTON SHELL CLUB

PUBLICATIONS

COOKIA is the journal of the Wellington Shell Club and is published annually, containing articles and smaller items of interest on shells, shell collecting, and molluscs as well as other related marine topics Members and other readers are invited to submit contributions (handwritten, typed, or electronic, equally acceptable) but, preferably, these should be in the Editor's hand before the end of May for inclusion in that year's issue (look at a recent issue to see the style to follow).

Cookia was first published in 1976; prior to this the Club published a *Circular*, then a *Bulletin*, as well as occasional *Study Notes* on various families of Mollusca.

PUBLICATIONS TO DATE:

1956-1965 *Circular* 1 to 21
1967-1975 *Bulletin* 1 to 36
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1977-1978 *Cookia* Volume 2, Nos 1, 2, 3
1979-1980 *Cookia* Volume 3, Nos 1, 2, 3
1980-1981 *Cookia* Volume 4, Nos 1, 2, 3
1982-1984 *Cookia* Volume 5, Nos 1, 2, 3, 4
1985-1992 *Cookia* Volume 6, Nos 1, 2, 3, 4
1993-1996 *Cookia* Volume 7, Nos 1, 2, 3, 4 (Index)
1997 *Cookia* Volume 8
1998 *Cookia* Volume 9
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2001 *Cookia* Volume 12
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(*Cookia* Volume 7, No. 4, is an index of all articles in the Club's publications to 1996)

BACK NUMBERS

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